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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 30, 1983 Volume 1033 Number 5

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General and Mechanical (4,400,829)		1743
Chemical (4,401,435)		1953
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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of July 1983

Affirmed	164
Affirmed in Part	17
Reversed	51
Total	232

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,542,914, Re. S.N. 505,711, Filed June 20, 1983, Cl. 147/264, METHOD OF HOLLOW ARTICLE CASTING, Joseph M. Lavergne, Jr., Owner of Record: *Joseph M. Lavergne, Sr., Spanaway, Wash.,* Attorney or Agent: Delbert J. Barnard, et al., Ex. Gp.: 147

4,032,972, Re. S.N. 498,971, Filed May 27, 1983, Cl. 358/142, PIGGY BACK GRABBING SYSTEM, Richard Saylor, Owner of Record: *IRD, Inc., Farmingdale, N.Y.,* Attorney or Agent: Lawrence G. Kurland, Ex. Gp.: 233

4,213,821, Re. S.N. 505,739, Filed June 20, 1983, Cl. 162/72, PULPING PROCESSES, Naphtali N. Vanderhoek, et al., Owner of Record: *Australian Paper Manufacturers Ltd., Victoria, Australia,* Attorney or Agent: Ralph E. Buckman, et al., Ex. Gp.: 173

4,247,351, Re. S.N. 506,845, Filed June 22, 1983, Cl. 156/221, PROCESS FOR MANUFACTURING ARTIFICIAL BREASTS, Cornelius Rechenberg, Owner of Record: *Amoena Corp., Atlanta, Ga.,* Attorney or Agent: Howard C. Miskin, Ex. Gp.: 161

4,249,975, Re. S.N. 506,846, Filed June 22, 1983, Cl. 156/245, PROCESS FOR MANUFACTURING ARTIFICIAL BREASTS, Cornelius Rechenberg, Owner of Record: *Amoena Corp., Atlanta, Ga.,* Attorney or Agent: Howard C. Miskin, Ex. Gp.: 161

4,273,909, Re. S.N. 504,799, Filed June 16, 1983, Cl. 528/45, ONE-PART SOLVENT-FREE THERMOSETTABLE BLOCKED PREPOLYMER COMPOSITION CONTAINING A DIENE, TOGETHER WITH CHAIN EXTENDER, CHAIN TERMINATOR AND A DIENOPHILE, Manuel J. Arco, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.,* Attorney or Agent: David R. Cleveland, Ex. Gp.: 143

4,274,398, Re. S.N. 506,624, Filed June 23, 1983, Cl. 128/20, SURICAL RETRACTOR UTILIZING ELASTIC TUBES FRICTIONALLY HELD IN SPACED NOTCHES, Frank B. Scott, Jr., Owner of Record: *Lone Star Medical Products, Inc., Houston, Tex.,* Attorney or Agent: Jennings B. Thompson, et al., Ex. Gp.: 335

4,298,012, Re. S.N. 502,155, Filed June 8, 1983, Cl. 131/296, METHOD OF INCREASING THE SPECIFIC VOLUME OF TOBACCO RIBS, Waldemar Wochnowski, Owner of Record: *Hauni-Werke Korber & Co., KG, Hamburg, Germany,* Attorney or Agent: Peter K. Kontler, et al., Ex. Gp.: 335

4,355,392, Re. S.N. 492,245, Filed May 6, 1983, Cl. 371/45, BURST-ERROR CORRECTING SYSTEM, Toshitada Doi, et al., Owner of Record: *Inventor,* Attorney or Agent: Lewis H. Eslinger, Ex. Gp.: 236

4,367,564, Re. S.N. 505,282, Filed June 17, 1983, Cl. 15/179, SWEEPER BRISTLE AND METHOD OF MAKING, John D. Holley, Owner of Record: *Holley Engineering Co., Inc., Montgomery, Ala.,* Attorney or Agent: Harold L. Stowell, et al., Ex. Gp.: 242

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,454,701, Reexam. No. 90/000,428, Requested: July 29, 1983, Cl. 424/273R, 2-(PHENYL-AMINO)-1,3-DIAZACYCLOPENTENE-(2) SUBSTITUTION PRODUCTS FOR REDUCING BLOOD PRESSURE, Karl Zeile, et al., Owner of Record: *Boehringer Ingelheim, GmbH, Ingelheim AM Rhein, Germany,* Attorney or Agent: Hammond and Littell, Ex. Gp.: 125, Requester: Zenith Laboratories, Inc., Northvale, N.J.

3,753,421, Reexam. No. 90/000,423, Requested: July 22, 1983, Cl. 119/29, METHOD AND APPARATUS FOR CONTROLLING AN ANIMAL, Richard M. Peck, Owner of Record: *Richard M. Peck, Allentown, Pa.*, Attorney or Agent: J. A. DeGrandi, Ex. Gp.: 330, Requester: Shiley Corp., Cincinnati, Ohio

3,994,221, Reexam. No. 90/000,426, Requested: July 28, 1983, Cl. 101/227, SHEETER FOR USE WITH PRINTING PRESS AND ADDING PROVISION FOR ARRESTING SQUARING AND DIVERTING OF SHEET, Francis John Littleton, Owner of Record: *Inventor,* Attorney or Agent: Neuman, Williams, et al., Ex. Gp.: 337, Requester: Oxy-Dry Corp., Elk Grove Village, Ill.

Errata

The following registration number, listed in the "Trademarks Registrations Issued" section of the Official Gazette of July 26, 1983 was inadvertently issued:

TMOG July 26, 1983

1,246,320

Consequently, the certificate of registration bearing the above-identified number was not issued on the date indicated, and this registration number has been vacated.

GERALD J. MOSSINGHOFF,
Commissioner of Patent and Trademarks.

July 29, 1983.

Status of PTO Services

The following is an update of the status of PTO services as of August 5, 1983:

Service Item	FY 1983 Performance Goal	Actual	Comment
Filing Receipts:			
Patents	22	23	
Trademarks	30	61	Reduced by 14 days in July.
Patent Copies:			
Window Coupons	5	96% within 5 days	
Mail Coupons	29	100% within 22 days	
Letter Orders	34	100% within 15 days	
Certified Copies:			
Trademark Registrations	30	11	Reduced 2 days in July.
Applications-As-Filed	20	99% within 10 days	
File-Wrapper/Contents	N/A	100% within 20 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	36	Reduced 13 days in July.
Filing Reg. Certificates	3	11	Reduced 4 days in July.
Assignments:			
Patents	25	22	Reduced by 3 days in July.
Trademarks	25	15	Reduced by 2 days in July.
Avg. Days from Issue Fee Payment to Issue Date	90-100	95	
Patent Official Gazette:			
In Bookstore	Issue Date	On Schedule	
Mailed	Issue Date	Avg. 2 days late	
Patent Grants Mailed	Issue Date	On Schedule	
Patent Copies Available	Issue Date	99%	
Trademark Official Gazette:			
In Bookstore	Issue Date	On Schedule	
Mailed	Issue Date	On Schedule	
Trademark Regs. Mailed	Issue Date	On Schedule	

IMPROVEMENTS TO SERVICES

- *New Search Room Security System*—On June 30, 1983, a new security system was installed in the Public Search Room. This system utilizes smaller and technically improved labels at a savings of $.08 each.
- *Microfilming Active Trademark and Patent File Histories*—From June 20, 1983 through July 19, 1983, sample microfiche copies of new patent issues and a Minolta Reader/Printer were made available to Public Search Room users. Each user was provided a survey form to assist us in evaluating file history formats and reader/printer equipment capability. While the volume of usage was low, the survey results indicated differing views on file history sequence and overwhelming support for the equipment.
- *Public Service Center*—The Patent and Trademark Office would like to remind our customers that the Public Service Center is located in Bldg. 3, Room 2-C24. The Center was established to assist the public in resolving problems in obtaining patent and trademark copies, any official PTO files, certified and uncertified copies of PTO documents and other public services. Please feel free to visit the Center or call them on 557-5168 whenever the need arises.
- *Mail Deposit Box*—The mail deposit box located in the lobby of Crystal Plz. Bldg. 3, which is normally used for after-hour deposits, has been replaced. The new box has a larger opening enabling the deposit of bulkier packages.

August 8, 1983.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Aug. 30, 1983,

4,144,190	4,357,068	4,378,100	4,385,027
4,218,333	4,358,022	4,378,388	4,385,370
4,252,149	4,360,905	4,379,067	4,385,653
4,260,562	4,361,901	4,379,202	4,385,730
4,287,563	4,363,844	4,379,311	4,386,563
4,308,809	4,364,251	4,379,773	4,387,088
4,310,472	4,366,973	4,379,868	4,387,302
4,312,013	4,367,243	4,379,932	4,387,763
4,312,870	4,368,043	4,380,832	4,388,134
4,314,151	4,368,751	4,380,928	4,388,182
4,315,756	4,369,173	4,382,144	4,388,219
4,324,340	4,369,578	4,382,279	4,388,255
4,326,450	4,371,233	4,382,832	4,388,929
4,330,225	4,372,655	4,382,903	4,389,108
4,332,497	4,372,843	4,383,056	4,389,249
4,334,906	4,372,948	4,383,444	4,389,484
4,335,648	4,372,985	4,383,574	4,389,766
4,338,553	4,373,422	4,383,733	4,390,695
4,340,737	4,374,431	4,383,916	4,391,042
4,341,081	4,375,645	4,384,061	4,391,384
4,351,328	4,376,218	4,384,126	4,391,608
4,353,450	4,376,851	4,384,401	4,392,728
4,355,537	4,377,036	4,384,727	
4,357,061	4,377,775	4,384,837	

Disclaimers

3,711,733.—*Robert R. Skutt,* Dayton, Ohio, INTERCONNECTED ELECTRODE DISPLAY MEANS. Patent dated Jan. 16, 1973. Disclaimer filed May 9, 1983, by the assignee, *NCR Corp.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

4,233,049.—*Samuel L. Seymour,* Oakmont, Pa. METHOD AND APPARATUS FOR SHAPING GLASS SHEETS BY DROP FORMING. Patent dated Nov. 11, 1980. Disclaimer filed July 11, 1983, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1, 8, 9, 10, 11, and 12 of said patent.

4,238,369.—*Max P. McDaniel, Melvin B. Welch* and *Alonzo G. Kitchen,* Bartlesville, Okla. CHROMIUM-SILICA CATALYSTS BY HYDROTHERMAL TREATING. Patent dated Dec. 9, 1980. Disclaimer filed July 6, 1983, by the assignee, *Phillips Petroleum Co.*

Hereby enters this disclaimer to all claims of said patent.

4,250,376.—*James D. Joseph,* Oakdale, Minn. and *Dennis J. Wilwerding,* Littleton, Colo. APPARATUS FOR RANGE FINDING EQUIPMENT. Patent dated Feb. 10, 1981. Disclaimer filed July 8, 1983, by the assignee, *Honeywell, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,332,713.—*Hans Lehmann,* Aesch, Switzerland. LIQUID OR PASTY THERMOSETTING ADHESIVE WHICH CAN BE PREGELLED AND WHICH IS BASED ON EPOXIDE RESIN, AND THE USE OF THIS ADHESIVE. Patent dated June 1, 1982. Disclaimer filed July 5, 1983, by the assignee, *CIBA-GEIGY Corp.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

4,334,703.—*James C. Arthur* and *Graham F. Thieman,* Columbus, Ind. TUBE-TO-PLATE CONNECTION. Patent dated June 15, 1982. Disclaimer filed July 16, 1982, by the assignee, *Arvin Industries, Inc.*

The term of this patent subsequent to June 8, 1999, has been disclaimed.

4,385,421.—*Eugene G. Martin,* New Holland, Pa. POULTRY LEG/BACK PROCESSOR. Patent dated May 31, 1983. Disclaimer filed July 11, 1983, by the asssignee, *Victor F. Weaver, Inc.*

Hereby enters this disclaimer to claims 9 and 10 of said patent.

Dedications

3,312,548.—*Virgil E. Straughan,* Euclid, Ohio. XEROGRAPHIC PLATES. Patent dated Apr. 4, 1967. Dedication filed Oct. 21, 1982, by the assignee, *Xerox Corp.*

Hereby dedicates to the Public the entire remaining term of said patent.

4,070,708.—*Stephen H. Smallcombe* and *Howard D. W. Hill,* Cupertino, Calif. ANALYTICAL INSTRUMENT OPTIMUM DATA ACQUISITION METHOD AND APPARATUS. Patent dated Jan. 24, 1978. Dedication filed July 14, 1983, by the assignee, *Varian Associates, Inc.*

Hereby dedicates to the Public all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Austin: McKinney Engineering Library, University of Texas....	(512) 471-1610
	Dallas Public Library	(214) 749-4176
Washington	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Wisconsin	Seattle: Engineering Library, University of Washington	(206) 543-0740
	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

AUGUST 30, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,747,620 (120th)
IRRIGATION SPRINKLER SYSTEM CONTROL EMPLOYING PILOT OPERATED, PRESSURE ACTUATED AND SEQUENCED VALVE ASSEMBLIES
Carl L. C. Kah, Jr., North Palm Beach, Fla., assignor to The Toro Co., Minneapolis, Minn.
Reexamination Request No. 90/000,249, Aug. 30, 1982.
Reexamination Certificate for Patent No. 3,747,620, issued Jul. 24, 1973, Ser. No. 222,600, Feb. 1, 1972.
Continuation of Ser. No. 90,732, Nov. 18, 1970, abandoned.
Int. Cl.[3] **G05D** *11/00;* **A01G** *25/02;* **F17D** *3/00*
U.S. Cl. 137—119

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **54–78** and **81–87** is confirmed.

Claims **1**, **3**, **4**, **6–9**, **11–17**, **19–28**, **34**, **39**, **41–44**, **46**, **47**, and **49–53**, having been finally determined to be unpatentable, are cancelled.

Claims **2**, **5**, **10**, **18**, **29**, **32**, **33**, **35**, **36**, **40**, **45**, **48**, and **79** are determined to be patentable as amended:

Claims **30**, **31**, **37**, **38**, and **80**, dependent on amended claims, are determined to be patentable.

New claims **88–95** are added and determined to be patentable.

2. [A valve assembly as set forth in claim **1** wherein] *A pressure actuated and sequenced valve assembly comprising; a main valve for controlling fluid flow therethrough, a main valve actuator for opening and closing said main valve; first passage means for constantly imposing pressure forces on one side of said main valve actuator, second passage means for imposing pressure forces on the other side of said main valve actuator, third passage means for venting the other side of the main valve actuator, a pilot valve biased to close said third passage means, means responsive to pressure variations for opening and closing said pilot valve, the last named means including a sequencing means for controlling the opening movement of said pilot valve and fluid pressure actuating means for indexing said sequencing means and opening said pilot valve, fourth passage means for communicating a pressure to said fluid pressure actuating means, said sequencing means including a plurality of indexing elements, ratcheting means mounted for intermittent driving engagement with said indexing elements and drivingly interrelated with said fluid pressure actuating means for translating pressure changes into indexing movement of said sequencing means,* said fluid pressure actuating means [includes] *including* two separate pressure responsive means, one pressure responsive means being connected to said sequencing means and the other pressure responsive means being connected to said pilot valve.

REISSUES

AUGUST 30, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

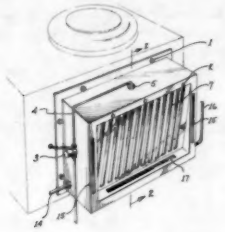
Re. 31,360
FIBERGLASS AIRCONDITIONER AIR PRE-COOLER

Anthony C. Manno, 8644 E. Bonnie Rose Ave., Scottsdale, Ariz. 85253

Original No. 4,212,172, dated Jul. 15, 1980, Ser. No. 910,885, Jun. 20, 1978. Application for reissue May 4, 1981, Ser. No. 260,263

Int. Cl.³ F28D *5/00*

U.S. Cl. 62—305 **5 Claims**



1. An apparatus for cooling the condensor coils of an air conditioning system comprising an evaporator, compressor and condensor, said apparatus having four sides, a front and a rear, fiberglass vane means located on the front, said vane means being so arranged as to provide moisture pick up by turbulent air thus cooling such air, a laminated fiber filter assembly filled with nylon material for separating the moisture from the air and protecting the condensor coils, said filter assembly located on the rear of the apparatus against the condensor coils, a plastic spray nozzle mounted above the vanes for directing cooling water on to the interior of the vanes, a fiber glass water ramp located at the bottom of the vanes and the filter assembly, a reservoir mounted below the ramp for collecting the water flowing from the filter assembly, drain means in said reservoir for controlling the water level, said apparatus increasing the efficiency of the air conditioning system by reducing the running time of the compressor and the condensor and evaporator fan motors, a solenoid used to control the flow of water.

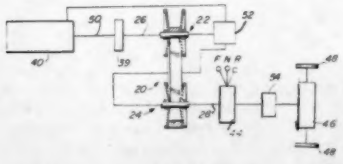
Re. 31,361
VARIABLE PULLEY TRANSMISSION

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Original No. 4,241,618, dated Dec. 30, 1980, Ser. No. 16,862, Mar. 2, 1979. Application for reissue Apr. 23, 1982, Ser. No. 371,391

Int. Cl.³ F16H *55/52*

U.S. Cl. 74—863 **13 Claims**



1. In a power transmission apparatus adapted to transmit rotary motion between an engine with an engine shaft and a driven means such as the driving wheels of a vehicle and the like and having a variable rotary pulley drive unit with a driver pulley and a driven pulley connected by a belt means, each pulley having a pair of flanges, at least one flange of which is axially movable with respect to the other flange to change the spacing between the flanges and thus the speed ratio between the pulleys, and means responsive at least to the speed of the engine shaft to change the spacing of the pulley flanges and thus the speed ratio, the improvement which comprises:

means connecting said driver pulley directly to the engine shaft so that the pulleys are continuously rotated only in one direction when the motor is operating and its shaft is rotating, the continuous rotation of said pulleys when said engine is operating enchancing the shifting of the belt means on said pulley flanges when the speed ratio between the pulleys is changed;

means comprising a speed-responsive friction starting device *responsive to the speed of the engine* drivingly connecting said driven pulley and said driven means; and

means to select the direction of rotation of said driven means.

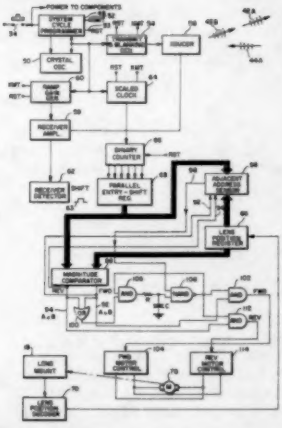
Re. 31,362
AUTOFOCUS MOVIE CAMERA HAVING PULSED TERMINAL DRIVE MEANS

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Original No. 4,238,143, dated Dec. 9, 1980, Ser. No. 276, Jan. 2, 1979. Application for reissue Apr. 8, 1982, Ser. No. 366,813

Int. Cl.³ G03B *3/10*; **G05B** *5/01, 19/29*

U.S. Cl. 352—140 **13 Claims**



11. An autofocus camera comprising:

means for determining subject distance; an adjustable lens displaceable for focusing an image of the subject on the focal plane of the camera; drive means for displacing the lens; and control means for controlling said drive means to provide a relatively constant driving force to said lens before it reaches a position in advance of the focal position desired in correlation with the determined subject distance, and for thereafter providing a pulsating driving force to said lens until said lens reaches said desired focal position.

Re. 31,363
METHOD FOR REDUCING THE NITROGEN CONTENT OF SHALE OIL WITH A SELECTIVE SOLVENT COMPRISING AN ORGANIC ACID AND A MINERAL ACID

Carole S. Stover, Van Nuys, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Original No. 4,209,385, dated Jun. 24, 1980, Ser. No. 52,636, Jun. 27, 1979. Application for reissue Feb. 12, 1981, Ser. No. 233,734

Int. Cl.³ C10G *17/04*

U.S. Cl. 208—254 R **15 Claims**

1. A method for reducing the nitrogen content of shale oil by removing nitrogen-containing compounds from shale oil, comprising the steps of:

extracting the shale oil with an immiscible selective solvent system for the nitrogen-containing compounds comprising an organic acid and a mineral acid; and

separating the immiscible selective solvent system containing nitrogen-containing compounds from the shale oil having a reduced nitrogen content.

4. A method as recited in claim 1 wherein the ratio of the organic acid to the mineral acid in the selective solvent is from about [1:5 to about 1:60] *60 :1 to about 5:1.*

Re. 31,364
OXIDATION AND AMMOXIDATION CATALYSIS

Kenneth V. Wise, Ballwin, Mo. assignor to Monsanto Company, St. Louis, Mo.

Original No. 4,162,992, dated Jul. 31, 1979, Ser. No. 866,596, Jan. 3, 1978. Application for reissue Apr. 29, 1982, Ser. No. 373,066

Int. Cl.³ B01J *29/16, 23/14*

U.S. Cl. 252—456 **8 Claims**

1. A catalyst for oxidation and ammoxidation of hydrocarbons consisting essentially of catalytic components having the empirical formula

$$Sb_aV_bTi_cO_x$$

wherein a is at least 6, b is 1, and c is a number such that the ratio of c/a is [at least 0.5] *from 0.75 to 3,* and x is a number taken to satisfy the valence requirements of the metal ions present.

Re. 31,365
SOLID STATE ELECTROLYTES

Geoffrey W. Mellors, North Royalton, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Original No. 4,186,248, dated Jan. 29, 1980, Ser. No. 973,552, Dec. 27, 1978. Application for reissue Jun. 28, 1982, Ser. No. 392,714

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—191 **5 Claims**

13. A solid state cell electrolyte comprising an ionically conducting product of a fused ternary mixture of lead fluoride, an alkali salt selected from the group consisting of sodium salts, cesium salts and nonfluoride-containing salts of potassium and rubidium in a range of between about 1.0 and about 15.0 mole percent and a fluoride, nitrate or sulfate of magnesium, calcium, strontium or barium in a range of between about 1 and about 40 mole percent.

Re. 31,366
MELAMINE RESIN, PROCESS FOR ITS MANUFACTURE AND ITS USE FOR THE MANUFACTURE OF COATED WOOD-BASED MATERIALS AND LAMINATES

Peter Dörries, Frankfurt am Main; Steffen Piesch, Oberursel, and Alfons Wolf, Seligenstadt, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

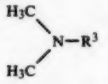
Original No. 4,250,282, dated Feb. 10, 1981, Ser. No. 93,292, Nov. 13, 1979. Application for reissue Jan. 11, 1982, Ser. No. 338,504

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2851760

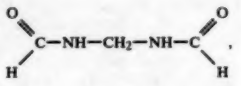
Int. Cl.³ C08G *8/28;* **C08F** *283/00*

U.S. Cl. 525—509 **11 Claims**

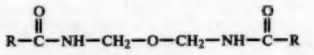
14. Melamine-formaldehyde resin comprising (a) melamine-formaldehyde precondensation product wherein the molar ratio of melamine:formaldehyde is 1:1.4 to 1:2.6 and (b) 0.1 to 1.0% by weight, based on total solids, of an amine of the formula



wherein R^3 is 2-hydroxyethyl or 2,3-dihydroxypropyl, wherein said amine may be present entirely or partially in the form of its reaction product with the melamine-formaldehyde precondensation product and (c) 0.5 to 40% by weight, based on total solids, of a modifying agent selected from lower, saturated fatty acid amides, methylene-bis-formamide of the formula

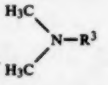


bis-(N-acylaminomethyl ethers of the formula

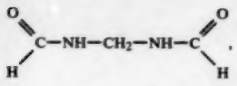


and mixtures thereof, wherein R is hydrogen, methyl or a condensation product of ε-caprolactam, formaldehyde and formamide in a molar ratio of 1:a:b, respectively, in which a is a number from 1 to 20, b is a number from 1 to 19, and a and b are so chosen that the quotient a/(b+1) is 0.5 to 1.

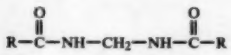
22. In the process for the manufacture of the melamine-formaldehyde resin as claimed in claim 14 by a condensation reaction of melamine and formaldehyde in the presence of inorganic bases in the pH range of 8.2 to 10.4, wherein the improvement comprises (a) condensing melamine and formaldehyde in a molar ratio of 1:1.4 to 1:2.6 until a dilutability with water of 1:3 to 1:0.8 is obtained, and (b) adding before, during or after 0.1 to 1.0% by weight, based on total solids, of an amine of the formula



wherein R^3 is 2-hydroxyethyl or 2,3-dihydroxypropyl wherein said amine may be present entirely or partially in the form of its reaction product with the melamine-formaldehyde condensation product and (c) adding before, during or after 0.5 to 40% by weight, based on total solids, of a modifying agent selected from lower, saturated fatty acid amides, methylene-bis-formamide of the formula



bis-(N-acylaminomethyl) ethers of the formula



and mixtures thereof, wherein R is hydrogen, methyl, or a condensation product of ε-caprolactam, formaldehyde and formamide in a molar ratio of 1:a:b, respectively, in which a is a number from 1 to 20, b is a number from 1 to 19, and a and b are so chosen that the quotient a/(b+1) is 0.5 to 1.

Re. 31,367

MOTOR STARTING AND PROTECTING APPARATUS

John R. D'Entremont, Foxboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original No. 4,092,573, dated May 30, 1978, Ser. No. 709,673, Jul. 29, 1976. Continuation-in-part of Ser. No. 642,858, Dec. 22, 1975, abandoned. Application for reissue Aug. 15, 1978, Ser. No. 934,101

Int. Cl.[3] **H02H** *7/085*

U.S. Cl. 361—27 **13 Claims**

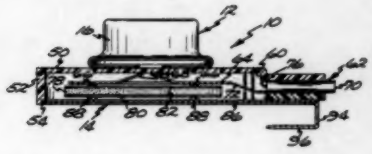
1. A combination motor starter and protector apparatus comprising:

a starter portion including a housing,

terminal means mounted in the housing for connecting a motor starter and protector apparatus to a motor and a source of power,

an element composed of positive temperature coefficient (PTC) of resistivity material disposed in the housing, electrical lead means connecting the element to the terminal means,

a protector portion including first and second electrical contacts disposed in the housing electrically connected to the terminal means, the contacts movable relative to one another into and out of engagement, a thermostatic member disposed in the housing and operatively connected to the set of contacts, the thermostatic member adapted to move from a first configuration in which the contacts are in engagement to a second configuration in which the contacts are out of engagement and back to the first configuration, the contacts interposed between the source of power and the motor so that when the contacts are out of engagement the motor is deenergized, and selected thermal resistance means *between approximately 5°-9° C./watt disposed* between the PTC element and the protector portion.



PLANT PATENTS

GRANTED AUGUST 30, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,093

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 27, 1982, Ser. No. 382,490

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by red and yellow bicolored flowers borne on a vigorous, but low growing plant.

5,094

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 27, 1982, Ser. No. 382,588

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by "hand painted" flowers starting with current red and chrome yellow coloring changing to Neyron rose and white as flowers age.

5,095

DISTINCT VARIETY OF APPLE TREE

John Nicklin, Marlboro, N.Y., assignor to Hilltop Orchards & Nurseries, Inc., Hartford, Mich.

Filed Oct. 8, 1981, Ser. No. 309,580

Int. Cl.[3] **A01H** *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree substantially as described and illustrated in this application.

5,096

BLACK SWEET CHERRY

Cecil Rynbrandt, and John Rynbrandt, both of Dorr, Mich., assignors to Hilltop Orchards & Nurseries, Inc., Hartford, Mich.

Filed Oct. 8, 1981, Ser. No. 309,586

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of black sweet cherry tree substantially as described and illustrated in this application.

PATENTS

GRANTED AUG. 30, 1983

ERRATA

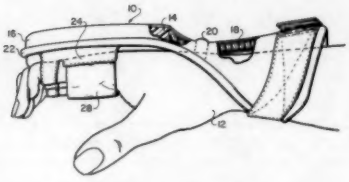
For CLASS	See PATENT NO.
414–564	4,400,841
132–151	4,400,879
292–144	4,401,346
008–471	4,401,692
429–221	4,401,714
548–136	4,401,817
525–061	4,401,836
367–036	4,402,028

PATENTS

GRANTED AUGUST 30, 1983

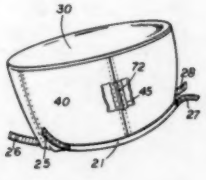
GENERAL AND MECHANICAL

4,400,829
PROTECTIVE FOOTBALL GLOVE
John R. Willis, 3770 Crown Point Dr. #303, San Diego, Calif. 92109
Filed Jan. 8, 1982, Ser. No. 337,966
Int. Cl.³ A41B *13/08*; A41D *19/00*
U.S. Cl. 2—16 **9 Claims**



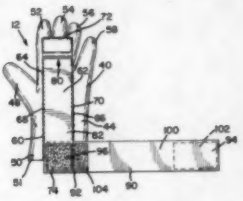
1. A protective football glove comprising:
a casing of tough pliable material for covering the back of the hand and extending from a point just past the first finger knuckles to a location before the wrist;
finger loops adjacent the outer end of said casing on the inner face thereof;
a hand pad of resilient material in said casing extending from the outer end of said glove to a point forward of the wrist for covering the back of the hand;
a wrist pad of resilient material in said casing and extending from a point inward from said hand pad to a point a short distance up the arm from the wrist;
a hinging bead between said hand pad and said wrist pad for accommodating wrist flexing;
wrist strap means extending from one side of said casing and having quick connect means thereon; and
quick connect means on the back of said casing for connecting with said quick connect means on said wrist strap;
said quick connect means being adjustable.

4,400,830
SHOWER CAP
Magdha Gaitan, 1450 S. Bayshore Dr., Apt. 914, Miami, Fla. 33131
Filed Sep. 24, 1982, Ser. No. 422,550
Int. Cl.³ A42B *1/112*
U.S. Cl. 2—68 **4 Claims**



1. A shower cap, comprising:
A. a crown to completely cover the hair of the wearer's head having a top section defined by a rigid loop attached thereto and a lateral section attached to the periphery of said top section, the lower edge of said lateral section defining an opening that receives the wearer's head;
B. a pair of strips secured to the lower edge of said lateral section and having a termination on each end that is detached from said lateral section;
C. means for adhering said terminations to each other thereby providing a snug fit to the wearer's head;
D. a plurality of vertical support members extending downwardly and perpendicularly from said loop and being secured to the inner wall of said lateral section thereby providing structural integrity.

4,400,831
GLOVE ARRANGEMENT FOR WATER SKIING
Peter W. Rietz, Box 824, Georgetown, Colo. 80444
Filed Jan. 26, 1982, Ser. No. 342,753
Int. Cl.³ A41D *19/00*; A63B *53/14*
U.S. Cl. 2—161 A **14 Claims**



1. In a water ski glove for application to the hand of a water skier that provides a hand cover including a palm portion, a finger portion, a thumb portion, and a wrist portion each including a palm side and back side, the improvement wherein:
said glove has fixed thereto and extending between said glove finger portion and said wrist portion on said palm side thereof a palm side strapping that extends longitudinally of the glove,
said palm side strapping having a protuberant rib extending crosswise of the glove palm side and transversely of the glove finger portion,
said rib being located adjacent the first finger joint area of the glove finger portion,
said rib projecting outwardly of said palm side strapping,
a wrist strapping anchored to the wrist end of said palm side strapping,
and means for securing said wrist strapping in close fitting relation about the glove wrist portion when the water skier has inserted his hand in the glove.

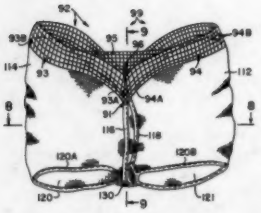
4,400,832
PANTY GARMENTS WITH REDIRECTED STRESS SUPPORT STRUCTURE
Carolyn Kinder, Star Rte., Box 44, Stuttgart, Ark. 72160
Filed Dec. 9, 1980, Ser. No. 214,655
Int. Cl.³ A41B *9/04*
U.S. Cl. 2—406 **5 Claims**

1. A garment such as panty hose, tights, leotards or the like, the garment comprising:
a panty portion;
a pair of left and right elongated, tubular leg portions coupled to said panty portion; and,
stress redirecting means for supporting said panty and leg portions and comprised of first left, and second right elongated waistband members which, when said garment is worn are stressed and anchored upon the wearer's hips above the crest of the wearer's ilium and which downwardly converge at the front of the wearer toward the lowermost pelvic region of the wearer, said first left elon-

gated waistband member structurally coupled to said left tubular leg portion to form a redirected stress pattern extending diagonally across the left hip between the top of the wearer's left ilium crest and the pubic area of the left upper inner thigh, said second right elongated waistband member structurally coupled to said right tubular leg portion to form a redirected stress pattern extending diagonally across the right hip between the top of the wearer's right ilium crest and the pubic area of the wearer's right upper inner thigh.

4. A panty garment comprising:

a body portion for covering the lower torso of the wearer, the body portion having left and right leg holes and,



stress redirecting means for supporting said panty portion comprised of first left and second right elongated members anchored upon the wearer's hips above the crest of the illium and downwardly converging to an anchor point near the lowermost pelvic region of the wearer, said first left elongated waistband member structurally terminating adjacent said left leg hole to form a redirected stress pattern extending diagonally across the left hip between the top of the wearer's left ilium crest and the pubic area of the left upper inner thigh, said second right elongated waistband member structurally terminating adjacent said right leg hole to form a redirected stress pattern extending diagonally across the right hip between the top of the wearer's right ilium crest and the pubic area of the wearer's right upper inner thigh.

4,400,833

MEANS AND METHOD OF IMPLANTING BIOPROSTHETICS

Kenneth Z. Kurland, 2 W. McCabe Rd., El Centro, Calif. 92243

Filed Jun. 10, 1981, Ser. No. 272,134

Int. Cl.³ A61F *1/00, 1/24*

U.S. Cl. 3—1 **8 Claims**

6. A bioprosthesis comprising:

(a) a tissue specimen in the form of a length of regular connective tissue treated to be non-antigenic;

(b) said length having at least one end designated for attachment to a bone of a patient to repair connective tissue damage; and

(c) a synthetic mesh fastened to said one end and positioned thereon to interface between the length of connective

tissue and the bone, whereby bone will grow around said mesh and into said one end of connective tissue to completely integrate said prosthesis into the physiology of the patient.

4,400,834

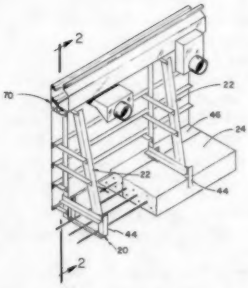
SWIMMING POOL WALLS WITH GUTTER AND CONDUIT CONSTRUCTION

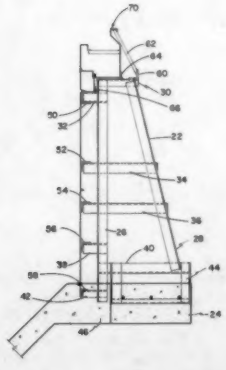
John F. Corna, Columbus, and Marcel H. Blais, Westerville, both of Ohio, assignors to Statewide Pools, Inc., Columbus, Ohio

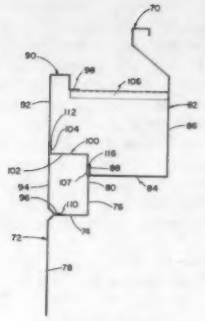
Filed Apr. 1, 1981, Ser. No. 249,748

Int. Cl.³ E04H *3/16, 3/18*

U.S. Cl. 4—506 **5 Claims**







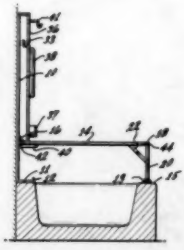
1. A swimming pool wall construction comprising, in combination, a supporting means defining a pool wall location; a plurality of sheet metal components assembled on said supporting means and forming a gutter and conduit assembly said sheet metal components comprising, in combination, a gutter wall component on said supporting means and forming a gutter outer wall portion, a gutter bottom wall portion, and an upturned flange forming a gutter wall component inner edge portion; a conduit bottom wall component on said supporting means and forming a conduit bottom wall portion and an upturned outer flange forming a conduit bottom wall component outer edge portion; a conduit closure component forming a conduit top closure portion and a downturned outer flange forming a conduit closure outer edge portion, said first and second upturned flanges and said downturned outer flange being positioned in ajoining relationship at a three component junction for said gutter wall component, said conduit bottom wall component and said conduit closure component; and a single continuous weld joining the three component junction for joining together said gutter wall component, said conduit bottom wall component, and said conduit closure component, said single continuous weld forming a water tight seam between the conduit and the gutter.

4,400,835

BATH SUPPORT

Jutta M. Richter, 2750 Wheatstone, Space #34, San Diego, Calif. 92111

Filed Nov. 5, 1980, Ser. No. 204,483
Int. Cl.³ A47K *3/022*
U.S. Cl. 4—578 **4 Claims**



1. A fold away bathing support unit for securing to a bathroom wall adjacent a shower or a tub, comprising in combination:

a flat generally rectangular back panel for attachment directly to a vertical bathroom wall adjacent a shower or tub;

a support member of a generally planar rectangular configuration having an inner end pivotally connected to said back panel at the lower end thereof, said support member having an outer end and a length substantially equal to the width of a standard bath tub, and being pivotal between an upright position against said back panel and an extended outward horizontal support position;

a pair of support legs pivotally mounted on the other end of said support member and pivotable to a support position extending vertically beneath said support member at said outer end for supporting said support member in the horizontally outward support position;

a pair of parallel slots formed in and extending along the edges of said support member for selectively mounting a backrest panel or two fence members;

a generally flat rectangular backrest panel detachably securable to either side of said support member by insertion in a selected one of said slots when said support is in the outward support position and

a cover member hinged to a side edge of said back panel to define a vertical hinge axis and being pivotal between a closed position generally parallel to said back panel and an open position to clear the way for said support member to pivot between its upright position and horizontal support position;

said cover having a lower edge terminating short of said support member when the latter is in its horizontal support position such that when the support member is in its horizontal support mode, said cover is free to pivot into its closed position;

said cover mounting a soap dish on a lower portion thereof such that same is accessible by a bather both when the support member is in its horizontal support position and when it is in its stowed upright position with the shower or tub being in normal use; and

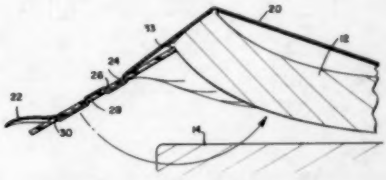
a handrail securely mounted on said cover and positioned to be usable by the bather with or without the support member being extended in its outward horizontal support position.

4,400,836

METHOD FOR FITTING BED SHEETS

Carme D. Pelura, Pennsville, N.J., assignor to Neat Nap, Incorporated, Pennsville, N.J.

Filed Jul. 31, 1981, Ser. No. 288,775
Int. Cl.³ A44B *21/00*; A47G *9/04*
U.S. Cl. 5—498 **12 Claims**



1. A method for facilitating the covering of a furniture piece, providing a flat plate which is sufficiently rigid to serve as a lever and sized and shaped to fit between a mattress or cushion and a mattress or cushion support of a furniture piece, said flat plate including

a slot through which a corner of a furniture covering is passed for securing said furniture covering to said plate,

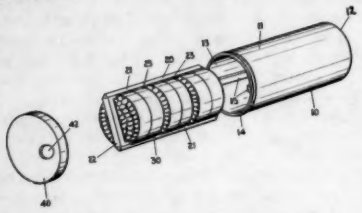
and using the plate as a lever arm for enabling a user to apply a moment to the plate to gain a mechanical advantage when placing a portion of the furniture covering between the mattress or cushion and the mattress or cushion support.

4,400,837

QUEEN BEE MATING NUCLEUS

Mel Disselkoen, 1941 Alba SW., Wyoming, Mich. 49509

Filed Aug. 6, 1981, Ser. No. 290,614
Int. Cl.³ A01K *49/00*
U.S. Cl. 6—1 **5 Claims**



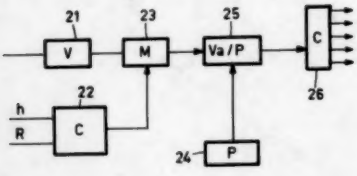
1. A queen bee mating nucleus comprising:
a housing having side walls, a closed back and an open front;
a removable cover on said open front, said cover having at least one ingress and egress opening therein;
a removable honeycomb rack positioned lengthwise in said housing with means to carry a plurality of honeycombs perpendicular to its length with the honeycombs parallel with and spaced from each other, said rack being slidable lengthwise in and out of said housing and surrounding two diametrically opposite side portions of said plurality of honeycombs and at least one transverse end portion; and
means for centering honeycombs in said housing spaced from the interior side walls to permit bees to move freely around the honeycombs carried by said rack.

4,400,838

METHOD OF DETERMINING THE AVERAGE NATURE OF THE MATERIALS OF THE LAUNDRY IN A LAUNDRY WASHING MACHINE AND WASHING MACHINE EMPLOYING SAID METHOD

Michel Steers, Chennevieres-sur-Marne, and Jean-Pierre Hazan, Sucy-en-Brie, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,302
Claims priority, application France, Jun. 13, 1980, 80 13202
Int. Cl.³ D06F *33/02*
U.S. Cl. 8—158 **6 Claims**



1. In a laundry washing machine which includes a memory, a method for determining the average nature of the materials of the laundry loaded into the tub of said machine, said method comprising the steps of:
measuring the weight of the laundry loaded into said tub;
filling said tub with water;
detecting the volume (V) and detecting the level (h) of the water admitted to said tub, at least one of the detections being effected continuously during said filling;
checking if said detected level (h) begins to exceed at least a first reference value, and generating a command signal if said detected level (h) begins to exceed said first reference value;
recording under control of said command signal the momentary volume (Va) of the water admitted into said tub;
determining, on the basis of said momentary volume (Va) and said weight, the volume of the water absorbed per unit of weight of the laundry;
determining the average nature of the materials of the laundry by comparing said volume of the water absorbed per unit of weight of the laundry with a series of typical absorbed water absorption values stored in said memory, each of said typical absorbed water absorption values corresponding to a laundry of a specific nature.

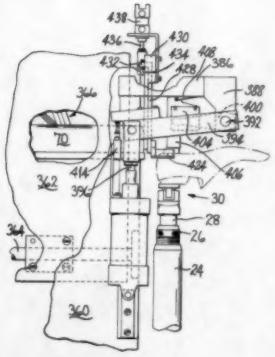
5. A washing machine employing a method for determining the average nature of materials of the laundry in a laundry washing machine, comprising:
a device for measuring the weight of the laundry loaded into the machine;
electronic means for storage of the laundry-weight value;
a device for continuously measuring the volume of water admitted to the tub; and
a device for continuously measuring the water level in said tub;
a device for determining the volume of water absorbed per unit of laundry weight having a first input connected to the device for continuously measuring the volume of water and a second input connected to the electronic means for the storage of the laundry-weight value, which device has an output connected to a device for identifying the average nature of the materials of the laundry in the tub.

4,400,839

MACHINE FOR LASTING HEEL SEAT PORTIONS OF SHOES

Frank Hartshorn, Wigston; Ivor J. R. le Vesconte, Birstall; Brian J. M. Murphy, Leicester, and Richard E. Storer, Syston, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Jan. 25, 1982, Ser. No. 342,712
Claims priority, application United Kingdom, Jan. 26, 1981, 8102298
Int. Cl.³ A43D *21/00, 89/00, 3/00*
U.S. Cl. 12—12.5 **6 Claims**



1. A machine for lasting heel seat portions of shoes, comprising:
shoe support means, comprising a heel support, including a last pin which is mounted for limited rocking movement about an axis extending heightwise of the bottom of a shoe supported thereby, and toe support means, including a toe support member which can be urged upwardly against the toe cap portion of a shoe supported on the last pin, thus to set the toe-to-heel orientation of the shoe bottom;
shoe centralizing means, comprising two shoe-engaging elements, arranged to engage the heel seat of the shoe at opposite sides of the last pin, said elements being movable

through equal distances thus to engage and centralize the shoe in relation to a longitudinal center line of the machine by rocking it together with the last pin, about said axis;

a holddown member which engages the shoe bottom in the heel seat region thereof, while the shoe is held by the shoe centralizing means;

a heel hand arrangement, between which and the shoe support means relative movement of approach can take place, after widthdrawal of the shoe centralizing means, thus to cause the heel end of the shoe engaged by the holddown member to be clamped by a heel band of said arrangement, in the operation of which arrangement equalized pressure is applied to opposite "legs" of the heel band so that the shoe is clamped substantially in the position in which it is presented to the heel band arrangement; and

heel seat lasting instrumentalities by which lasting marginal portions of the upper are wiped over and pressed against corresponding marginal portions of the insole.

4,400,840

BOOT SHAPER

Rex Sly, Turfpits Farm, Queen's Park, Crowland, Peterborough, Cambs, England

Filed Mar. 26, 1981, Ser. No. 247,665

Claims priority, application United Kingdom, Apr. 9, 1980, 8011764

Int. Cl.[3] **A43D** *5/00, 3/00*

U.S. Cl. 12—114.4 **12 Claims**

1. A boot shaper comprising a sock of impervious flexible material, said sock having:

a foot portion closed at the toe end;

a leg portion closed at the upper end except for access for inflation;

an air inlet means providing said access for inflation of the sock after insertion in a boot, thereby to pressurize the boot from the interior thereof;

an air pressure relief means for deflation of the sock prior to removal from the boot;

a handle means accessible at the upper end of the boot to enable removal of the deflated sock from the boot; and

a resilient spine serving to coil the sock in the deflated condition.

4,400,841

APPARATUS AND METHOD FOR HANDLING SHEET MATERIAL

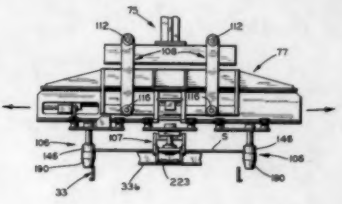
Roger M. Bresnahan, and Paul D. Jepson, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Feb. 26, 1981, Ser. No. 238,452

Int. Cl.[3] **B66C** *1/28;* **C03B** *23/02*

U.S. Cl. 414—564 **15 Claims**

1. A sheet handling apparatus comprising: an article pickup head, a plurality of opposed slides mounted on said head for translatory movement toward and away from each other, gripping members mounted on said slides, respectively, for movement therewith, and means on said head for moving said slides and the gripping members carried thereby for engagement with and disengagement from the opposite edges of at least one horizontally disposed sheet article, each of said gripping members comprising a shaft suspended from the associated slide thereof and an article engaging element mounted on said shaft for free sliding movement thereon, certain of said gripping members being provided with a cam element on said



shaft below said article engaging element engageable with an article receiving support means beneath said head for self-aligning said head relative to said support means.

4,400,842

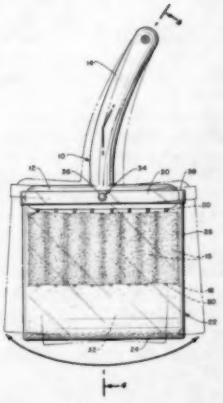
DUSTING BRUSH ASSEMBLY FOR VENETIAN BLINDS AND THE LIKE

Frank Vitonis, 530 West Wilson, Costa Mesa, Calif. 92627

Filed Jan. 18, 1982, Ser. No. 340,307

Int. Cl.[3] **A46B** *17/00, 17/04*

U.S. Cl. 15—247 **6 Claims**

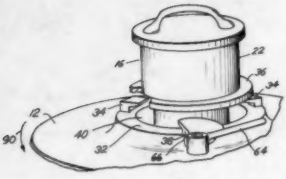


1. A dusting brush assembly for venetian blinds and the like comprising: a transverse brush frame having rigid handle a multiplicity of side by side finger-like brushes extending longitudinally therefrom; cover means having closed bottom and side walls and an open top for selectively receiving said brushes and a portion of said frame downwardly therein to telescopically enclose said brushes, said bottom and side walls of said cover means being longitudinally extended beyond longitudinally lengths of said brushes as positioned in said cover means; a fastener selectively engageable between said cover means and said brush frame portion retaining said frame portion and brushes therein permitting shaking of assembly of said brush frame and brushes enclosed by said cover means to deposit dust from said brushes into said cover means and into a longitudinally extended dust chamber in said cover means, said fastener having one portion thereof secured to said cover means and another portion thereof secured into said transverse frame portion.

4,400,843
ROTARY FLOOR CLEANER

Roland A. Blomgren, Glen Ellyn, Ill., assignor to Service Master Industries, Inc., Downers Grove, Ill.

Filed Oct. 9, 1981, Ser. No. 310,116
Int. Cl.³ A47L 11/162, 11/03
U.S. Cl. 15—49 R 8 Claims



1. In an improved rotary floor cleaner having, in combination, a rotatable cleaning rotor; a base circumferentially surrounding said cleaning rotor and including an opening adjacent to said cleaning rotor; and a drive mechanism disposed above said opening in said base, said drive mechanism including an electric motor and a housing, said motor in driving engagement with said cleaning rotor; wherein the improvement comprises:

(a) at least one mounting flange on the exterior side surface of said housing in proximity to the lower end thereof;

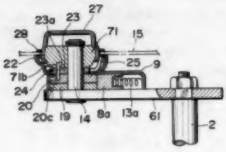
(b) at least one wedge block on said base adjacent to said opening, said wedge block having an inner edge, an outer edge in closer proximity to said opening relative to said inner edge and at a higher elevation from said base relative to said inner edge, and a front surface connecting said outer edge and said inner edge such that said front surface is inclined horizontally with respect to the plane of said opening, said wedge block being located so that said front surface faces said opening whereby said mounting flange is forced against said front surface when said drive mechanism is mounted on said base and forced in the direction of said wedge block; and

(c) a cam rotatably mounted around a first axis on said base adjacent to said opening, said cam rotatable between an unlocked position and a locked position, said cam having an arcuate first edge, an arcuate second edge in closer proximity to said opening relative to said first edge and at a higher elevation from said base relative to said first edge, and a shoulder surface connecting said first edge and said second edge such that said shoulder surface is inclined horizontally with respect to the plane of said opening, said first and second edges being radially disposed around a second axis, said second axis being offset from said first axis, whereby said first and second edges, and said shoulder surface, move relatively closer to said opening when said cam is rotated about said first axis, and whereby said shoulder surface is increasingly forced against said mounting flange when said drive mechanism is mounted above said opening and said cam is rotated about said first axis, thereby wedging said mounting flange between said front surface on said wedge block and said shoulder on said cam.

4,400,844
WIPER DEVICE

Nobuo Hayakawa, Higashimurayama; Yasuo Ohashi; Kenji Ohta, both of Yokohama; Yasumasa Takagi, Higashimatsuyama, and Masami Gotoh, Machida, all of Japan, assignors to Nissan Motor Co., Ltd. and Jidosha Denki Kogyo Kabushiki Kaisha, both of Yokohama, Japan

Filed Jan. 11, 1982, Ser. No. 338,599
Claims priority, application Japan, Jan. 14, 1981, 56-4757
Int. Cl.³ B60S 1/22; F16H 21/40
U.S. Cl. 15—250.16 10 Claims



1. A wiper device equipped with a rise up mechanism, comprising:

a motor;

a wiper blade;

a wiper pivot connected to the wiper blade;

a motor arm which rotates in a first direction during starting and wiper operations of the blade and which rotates in a reverse direction during stopping and parking operations of the blade;

a connecting rod having one end connected to the wiper pivot and having another end connected eccentrically to the motor arm for reciprocating in response to the rotation of the motor arm to swing the wiper pivot;

a retainer for retaining the connecting rod on the motor arm;

an eccentric member arranged to be rotatable with or relative to the retainer;

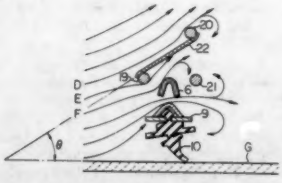
a friction spring disposed between the eccentric member and the retainer to prevent rotation of the eccentric metal relative to the retainer; and

a cam mechanism arranged to permit the eccentric member to rotate together with the retainer during the wiping operation and arranged to overcome the action of the friction spring and cause the eccentric member to rotate relative to the retainer just after the starting of the blade or just before the parking and stopping thereof and to change the effective length of the connecting rod to the eccentric degree of the eccentric member.

4,400,845
WINDSHIELD WIPER

Hiroki Noguchi, Oobu, and Akira Fukami, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 20, 1981, Ser. No. 265,691
Claims priority, application Japan, Jun. 3, 1980, 55-75355
Int. Cl.³ B60S 1/38
U.S. Cl. 15—250.42 3 Claims



1. A windshield wiper comprising:

a wiper blade including an elongated resilient member for wiping a windshield surface of a vehicle and a lever for holding said resilient member against such surface;

a wiper arm having one end thereof connected to said lever and the other end connected to a body of the vehicle for effecting oscillation of said blade;

a flat plate forming a portion of said lever and having opposite edge portions disposed upstream and downstream with respect to the air flow produced above the windshield surface upon the high speed running of the vehicle, said flat plate being inclined with respect to said windshield surface such that said upstream edge portion is located closer to said windshield surface than said downstream edge portion;

said flat plate being disposed such that the angle defined between the windshield surface and said flat plate is of the order of 35–45 degrees;

at least one upstream obstruction for disturbing the air flow, said upstream obstruction being disposed on said upstream edge portion of said flat plate so as to project from said flat plate toward the windshield surface; and

at least one downstream obstruction for disturbing said air flow, said downstream obstruction being disposed on said downstream edge portion of said flat plate so as to project from said flat plate away from the windshield surface.

4,400,846

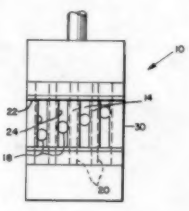
TAPE CLEANING APPARATUS

Robert A. Sanderson, Graham, Tex., assignor to Graham Magnetics, Inc., North Richland Hills, Tex.

Filed Oct. 2, 1981, Ser. No. 307,850

Int. Cl.³ B08B 5/04

U.S. Cl. 15—306 A **7 Claims**



1. A cleaning tool for use in fluid cleaning of a web passing thereover, said tool comprising a cleaning table provided with a plurality of apertures along the surface of said table, portions of perimeters of said apertures forming scraping means for cleaning said web, air ports in each sidewall adjacent to said table, adapted to be connected to a source of suction, said air ports extending above said table surface and forming means to conduct cleaning air impinging upon the top of said web laterally away from said web across each respective edge of said web, and wherein said air ports also extend below said table surface forming means to conduct cleaning air, impinging upon the bottom of said web from a source below said web, laterally away from said web across each respective edge of said web.

4,400,847

SELF-CLAMPING HINGE FOR SOLAR COLLECTOR FRAMES AND THE LIKE

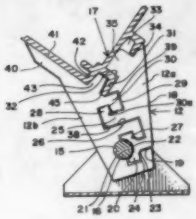
Webb W. Farber, Hampton, Fla., assignor to U.S. Solar Corporation, Hampton, Fla.

Filed Jul. 29, 1981, Ser. No. 288,086

Int. Cl.³ E05D 3/02

U.S. Cl. 16—223 **6 Claims**

1. In a self-clamping hinge for use in pivotally mounting a solar collector panel to a roof or other surface, the combination comprising, a rectangular solar panel framework formed along the outside with hinge interengagement means along its length, a pair of male and female hinge halves each having two mutually opposed ends and being fabricated of extruded metal sections, and having means along their lengths and between their ends operative to slidingly interfit and loosely interhookingly engage with one another, a head portion extending outwardly to one side of said male hinge half at one of said ends thereof, said head portion having an outer surface, the outer surface of said head portion having a first transversely-extending, semi-circular recess, one side of said female hinge half at one of said ends thereof having a second transversely-extending, semi-cylindrical recess defining, together with said first semi-cylindrical recess when said pair of male and female hinge halves are interhookingly engaged with one another, a cylindrical hinge pin opening, said slidingly interfitting means comprising a fulcrum intermediate the ends of said male and female hinge halves upon the sliding interfitting thereof providing for limited mutually rotative motion about said fulcrum of said hinge halves, a cylindrical hinge pin, said cylindrical hinge pin opening being of such size and said hinge pin being of such diameter as to constrain the other of said ends of said male and female hinge halves towards one another about said fulcrum upon the force fitting of said pivot pin within said hinge pin opening, the other of said ends of said male and female hinge halves comprising means for clamping attachment to the hinge interengagement means of the framework upon the sliding interfitting of said male and female hinge halves and subsequent force fitting of said pivot pin.



4,400,848

DOOR HINGE WITH A SLIDING CATCH

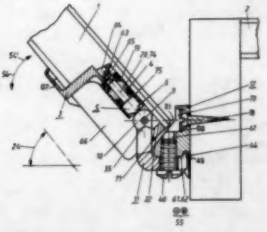
Alfred Grass, Konsumstrasse 20, A-6973 Höchst/Vlbg.-Österreich, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,551

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040287

Int. Cl.³ E05D 7/00, 11/10

U.S. Cl. 16—332 **7 Claims**



1. In an improved pressure-operated door hinge for concealed door-closed mounting and limited outward swing opening of a door member with respect to a support frame member and which provides force to keep the door member in a desired position with respect to the frame member, a base plate

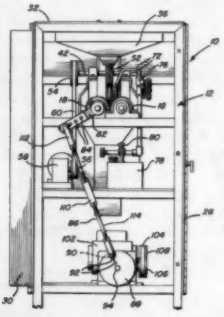
adapted to be mounted on the frame member, a hollow hinge box adapted to be mounted within the door member from its back side adjacent a side edge thereof, a connecting swing arm of angle shape having a pair of mounting end portions, one of said end portions extending from within said box and having a cam face pivotally mounted therein, means mounting the other of said end portions on said base plate, said box having a bore wall therein, extending along the inside thereof and being open at its inner front end within said box and open at its outer back end outside of said box, spring-pressed latch means extending in an operatively mounted relation along said bore wall within said box and from the inner front open end of said bore wall into operative engagement with said cam face, said latch means being introduced into an operating relation within said bore wall from the outer back open end thereof, and cross-extending keeper pin means carried in a transverse hole in a back end of said box to extend across the outer back open end of said bore wall and engage a back end of said latch means to securely hold said latch means in an operating position within said bore wall.

4,400,849

SHRIMP PEELING UNIT

Travis E. Dell, Rte. 7, Box 4390, Plant City, Fla. 33566

Filed Jan. 28, 1982, Ser. No. 344,804
Int. Cl.³ A22C *29/02*
U.S. Cl. 17—72 **10 Claims**



1. A shrimp peeling apparatus including a pair of journaled generally horizontal and parallel side-by-side rollers including at least closely adjacent sides defining an elongated upwardly opening "nip" area therebetween, means for supplying successive shrimp to be peeled to one end of said area, drive means operatively connected with said rollers for inversely oscillating the latter, said drive means including adjustment means operative to adjust the angular extent of oscillation of said rollers, the phase change speed of oscillation of said rollers, and the cycle frequency of oscillation of said rollers.

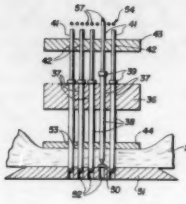
4,400,850

FOREIGN OBJECT DETECTOR FOR PROTECTION OF CARDING MACHINES

James H. Burnett, Greenville, S.C., assignor to Herman E. Cox, Greenville, S.C.

Filed Mar. 1, 1982, Ser. No. 353,167
Int. Cl.³ D01G *15/02*
U.S. Cl. 19—0.23 **8 Claims**

8. A foreign object detector for preventing damage to a carding machine caused by the presence of foreign objects in the lap entering the machine, said detector adapted to be placed astride the lap upstream from the machine feed roll, said detector comprising a power operated reciprocating carriage means above and across the lap including a spring-urged plate to compress the lap and spring-urged lap penetrating detector elements which in penetrating the lap contact hard foreign objects in the lap and are displaced upwardly by such objects, and a carding machine stop motion element on the carriage means above the tops of the detector elements in the path of



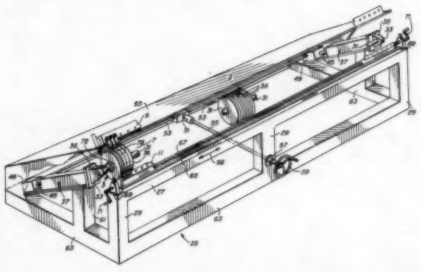
movement of displaced elements and adapted in response to contact with a displaced detector element to terminate the operation of a carding machine.

4,400,851

APPARATUS FOR TRAINING GIN SAWS AND GINNING RIBS FOR COTTON GINS

Bobby D. Hudson, deceased, late of Chandler, Ariz. (Bobby J. Hudson, personal representative), assignor to Bobby J. Hudson, Chandler, Ariz.

Filed Nov. 2, 1981, Ser. No. 317,303
Int. Cl.³ D01B *1/08*
U.S. Cl. 19—55 R **7 Claims**



1. An apparatus for training a gin saw assembly and a ginning rib assembly used in conjunction with the gin saw assembly in a cotton gin after the gin saw assembly and ginning rib assembly have been removed from the cotton gin for servicing, said gin saw assembly including a plurality of spaced gin saw blades coaxially installed on a rotatable shaft, said ginning rib assembly including an upper rail, a lower rail, and a plurality of spaced ginning ribs connected between the upper rail and the lower rail, said apparatus comprising in combination:

first means for mounting said gin saw assembly to allow rotation of said gin saw blades;

template means adjustably moving to align a plurality of alignment marks on said template means with respective ones of said gin saw blades for effecting accurate manual training of said gin saw blades;

second means for mounting said ginning rib assembly adjacent to said gin saw assembly to effect manual adjustment of individual ginning ribs of said ginning rib assembly; and

third means for moving said first means toward said ginning rib assembly mounted on said second means to move said individual gin saw blades into respective gaps between adjacent ones of said ginning ribs to provide a reference to facilitate manual adjustment of said individual ginning ribs.

4,400,852

DIRT SEPARATOR WITH A WEB-CARDING PLATE

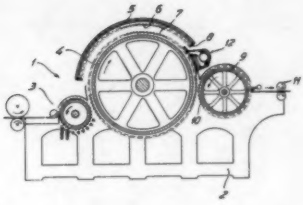
Walter Löffler, Neubulach, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 298,862

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034036

Int. Cl.³ D01G *15/82*

U.S. Cl. 19—106 R 5 Claims



1. An improved dirt separator, used with cards and combs of the type including a doffing cylinder and a main cylinder rotatable in a first rotational direction, the dirt separator of the type including a plate closely spaced apart a short radial distance from the main cylinder, a knife blade located to point against the direction of rotation of the main cylinder, at an adjustable distance from the latter, and at a peripheral distance behind the plate in the first rotational direction, a base face adjoining the knife blade in the first rotational direction, and an extraction chamber covering a gap between the plate and the knife blade, the improvement comprising: wherein the base face is covered with a sawtooth wire clothing; and means for mounting the dirt separator immediately in front of the doffing cylinder.

4,400,853

NEEDLE BAR DRAWING DEVICE

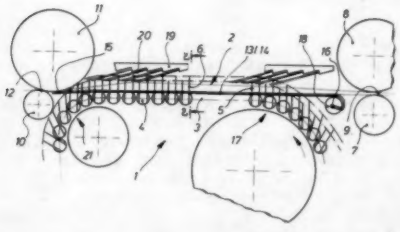
Jens Nagel, Mölln, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH + Co. KG, Lubeck, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 307,795

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037445

Int. Cl.³ D01H *5/02*

U.S. Cl. 19—129 R 5 Claims



1. Needle bar drawing device or gill box for slivers comprising needle field or gill area means defining a drawing plane and including a plurality of needle bars each carried by chain means to move said needle bars in a moving direction and a moving plane and each comprising a plurality of needles, and hold down means for holding down said slivers, said hold down means being arranged opposite said needle field means positioned between entrance and exit roller means, respectively, said exit roller means defining a clamping gap for said sliver, wherein bristle mat means are arranged to extend over at least part of the lateral extension of said needle field means and to be penetrated by said needles, said bristle mat means comprising at least one layer of bristles, which extend flatly in said moving direction and moving plane of said needle bars, lie closely adjacent to each other, are arranged approximately parallel to each other and extend over essentially the whole length of said needle field means up to the proximity of said clamping gap.

4,400,854

METHOD AND DEVICE FOR DEPOSITING SLIVER IN A ROTATING CAN

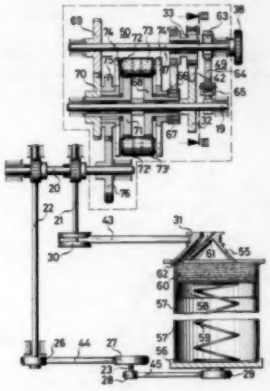
Johannes Socha, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,075

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802216

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—159 R 11 Claims



8. Device for carrying out the method for depositing sliver formed of textile fibers in cycloidal loops in a rotating can, comprising a rotatable funnel wheel disposed above the can, said funnel wheel having a sliver feed guide canal formed therein with an opening extending toward the can, the can being disposed on a rotatable turntable, output shaft means for rotating said funnel wheel, and supplemental transmission means connected to said output shaft means for periodically changing the angular velocity thereof.

4,400,855

STRAPPING BUCKLE CONSTRUCTION

Bruce W. Stuart, 1911 Heliotrope Dr., Santa Ana, Calif. 92710

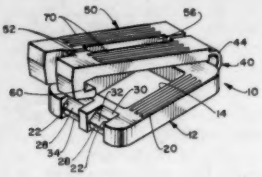
Filed Jun. 15, 1981, Ser. No. 273,966

Int. Cl.³ B65D *63/00*; F16L *33/10*

U.S. Cl. 24—200 10 Claims

1. A unitary clamp for maintaining the opposite extremities of a strap in predetermined, locked relationship with each other and the intermediate portion of said strap in encompassing relationship with an article, including a body, said body having a centrally located strap-receiving opening therein and incorporating spaced detent abutments at its forward extremity, said body having an integral pair of hinges at its rear extremity and each of said hinges having a locking arm formed integrally therewith, said locking arms having confronting abutment means thereupon and located in spaced relationship with one another, the forward extremities of said locking arms having retention recesses thereupon for receiving said detent abutments on said body and said detent abutments being re-

tained in operative relationship with said retention recesses to prevent disengagement of the opposite extremities of said strap



from locked operative relationship with said clamp and the intermediate extremity of said strap from disengagement with said article.

4,400,856

CARGO SECURING FITTING

Tsiung-Siung Tseng, No. 707, 3-4-28, Sakurazaka, Chuo-ku, Fukuoka-shi, Fukuoka-ken, Japan

Filed Mar. 11, 1982, Ser. No. 357,088
Claims priority, application Japan, Mar. 21, 1981, 56/42125
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—221 R **3 Claims**

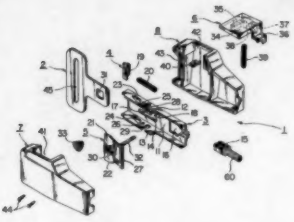
1. A cargo securing fitting comprising a base coupling member having a circular socket portion therein and, said circular socket portion including a plurality of outer spaced base coupling lugs projecting radially inwardly of the inner periphery of said socket portion and a circular central pillar extending upwardly of said socket portion to the same level as said base coupling lugs to define a substantially annular channel between said central pillar and the inner periphery of said socket portion, said central pillar being provided with a plurality of inner spaced base coupling lugs projecting radially outwardly of said central pillar in diametrically opposed relationship to said outer base coupling lugs; and a removable cap coupling member having a circular plug element projecting downwardly thereof, said plug element including a plurality of outer spaced cap coupling lugs projecting radially outwardly of the outer periphery of said plug element and a circular central recess formed in said plug element on its lower surface to define an annular projection for receiving in said annular channel, said central recess being provided with a plurality of inner spaced cap coupling lugs projecting radially inwardly of the periphery of said central recess in diametrically opposed relationship to said outer cap coupling lugs, said outer and inner coupling lugs on said cap coupling member being arranged to engage said outer and inner cap coupling lugs on said base cap coupling member, respectively, by turning said cap coupling member relative to said base coupling member either clockwise or counterclockwise when said annular projection on said plug element is in said annular channel in said base coupling member.

4,400,857

SEAT BELT BUCKLE

Masaru Morinaga, Yamato, Japan, assignor to NSK - Warner KK, Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,830
Claims priority, application Japan, Jun. 11, 1980, 55-81519[U]
Int. Cl.³ A44B *11/26, 19/00*
U.S. Cl. 24—230 A **7 Claims**



1. A seat belt buckle including a tongue defining at least one latch hole at a position remote from its outer periphery and a buckle body; said buckle body having a base, a latch member supported on said base so as to be swingable, in use, between engaging and non-engaging positions with respect to said tongue and normally urged to the engaging position, an actuating member for releasing the engagement between said latch hole of said tongue and said latch member, said actuating member being normally urged to a non-operative position, a casing enclosing said base, latch member and actuating member and defining a tongue insertion opening and an opening operably receiving said actuating member in a sunken position, and the latter opening when mounted on a vehicle facing toward the passenger so that the actuating member is slidable transversely of the direction of insertion of said tongue to the non-engaging position from the engaging position or vice versa, a latching portion of said latch member being movable substantially perpendicular to the direction of insertion of said tongue, said base being an elongated member having a central floor portion and a pair of side walls extending at right angle respectively from both sides of said floor portion, said latch member being generally of a rectangular configuration and being held swingably about the front edge thereof by said side walls, said latching portion being formed remote from said front edge and normally urged toward said floor portion of said base, said latch member including at least one arm extending substantially at right angle from the rear edge thereof toward the actuating member.

4,400,858

HEAT SINK/RETAINER CLIP FOR A DOWNHOLE ELECTRONICS PACKAGE OF A MEASUREMENTS-WHILE-DRILLING TELEMETRY SYSTEM

John J. Golffon, Grapevine, and S. Tom Thawley, Dallas, both of Tex., assignors to Tele-Drill Inc,, Richardson, Tex.

Filed Jan. 30, 1981, Ser. No. 229,795
Int. Cl.³ A44B *21/00;* F16L *35/00;* H02B *1/04*
U.S. Cl. 24—255 BS **11 Claims**

1. A heat sink/retaining clip for resiliently retaining a first object within a second object having a circular cross-section, said clip comprising:

a first portion dimensional to extend at least partially across the circular cross-section of the second object from a first point located interiorly of the second object to a second point located on the inner periphery of the second object;

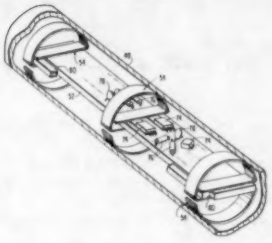
a second portion connected to said first portion at said second point and shaped to extend part way around the inner periphery of the second object from said second point to a third point located on the inner periphery of the second object,

said second portion being made of a resilient material and having a radius of curvature which is slightly greater than the inner radius of the second object;

a third portion connected to said second portion at said third point and dimensional to extend across the circular cross-section of the second object from said third point to a fourth point located on the inner periphery of the second object,

said third portion being spaced from said first portion by a distance slightly less than the thickness of the first object; and

a fourth portion connected to said third portion at said fourth point and shaped to extent part way around the



inner periphery of the second object from said fourth point to a fifth point located on the inner periphery of the second object,

said fourth portion being made of a resilient material and having a radius of curvature which is slightly greater than the inner radius of the second object, such that

when the first object is placed between said first and third portions and said clip is placed within the second object, contact of the outer peripheries of said second and fourth portions with the inner periphery of the second object causes said clip to distort, grippping the first object between said first and third portions and supporting the first object within the second object.

4,400,859

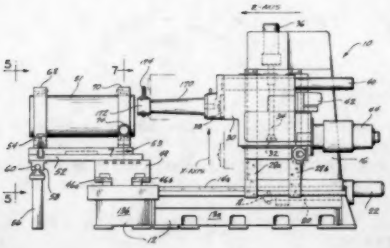
MACHINING CENTERS FOR MACHINING TUBULAR WORKPIECES

Robert T. Woythal, West Allis, and Philip J. Finet, Milwaukee, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 23, 1980, Ser. No. 219,529

Int. Cl.³ B23Q *1/14*

U.S. Cl. 29—27 C **4 Claims**



1. A machine tool for machining the interior surfaces of workpieces comprising:

a base;

a member movably supported on said base for movement along two mutually transverse paths;

an elongated arm extending forwardly from said movable member;

a spindle head supported by the extending end of said arm;

a cutter carrying spindle rotatably mounted in said spindle head with its axis disposed at an angle to the axis of said arm;

power means connected to rotate said cutter for performing a work operation on a workpiece;

a worktable movably supported on said base for movement along a path orthogonal to each of said two transverse paths of member movement;

a first plate fastened to said worktable;

a second plate overlying said first plate and being journaled on said first plate for rotation about an axis perpendicular to the axis of worktable movement;

a pair of guards, each extending outwardly opposite from one of the edges of said second plate to prevent human appendages from being scissored between said first and second plates when said second plate is rotated relative to said first plate;

a spring loaded pin disposed vertically through said first and second plates for releasably locking said first and second plates together to prevent rotation of said second plate relative to said first plate; and

a first and second pair of spaced apart spindles rotatably mounted on said second plate for supporting the workpiece with its axis parallel to the axis of the arm to allow insertion of said spindle head into the workpiece so that said cutter can perform a work operation on the interior of the workpiece.

4,400,860

METHOD FOR PRODUCING A CARTRIDGE FOR PURIFYING EXHAUST GAS

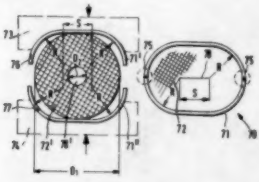
Manfred Nonnenmann, Schwieberdingen; Wolfgang Hesse, Remseck; Klaus Haller, Korntal, and Helmut Bardong, Stuttgart, all of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 104,019, Dec. 17, 1979, Pat. No. 4,282,186. This application Apr. 7, 1981, Ser. No. 251,963

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856030

Int. Cl.³ B23P *15/00*; F01N *7/18*

U.S. Cl. 29—157 R **9 Claims**



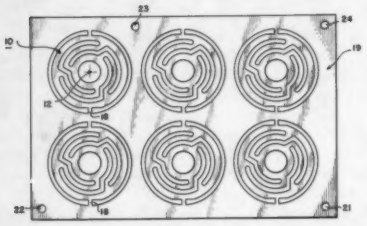
1. Process for producing a cartridge for purifying exhaust gases comprising a catalyst support matrix of wound metal foil and a metal jacket housing said support matrix wherein a press fit is formed between the exterior of the support matrix and the interior of the jacket and the support matrix and jacket are secured together in the area of the press fit, wherein the cross-sectional configuration of the cartridge is oval or elliptical in shape, comprising the steps of spirally winding the metal foil into a catalyst support matrix having a circularly cylindrical body; thereafter pressing the wound matrix between opposed tools provided with corresponding semi-elliptical dies to form the wound matrix to an oval or elliptical cross-sectional configuration; and inserting the wound matrix into the metal jacket housing.

4,400,861

FABRICATION OF SEISMIC SPRINGS FROM SHEETS

Carl E. Parker, Cypress, Tex., assignor to OYO Instruments, Inc., Houston, Tex.

Filed Nov. 27, 1981, Ser. No. 325,138
Int. Cl.³ B21F *35/00*
U.S. Cl. 29—173 **6 Claims**



1. A method of preforming at least one sheet containing a plurality of seismometer spider springs, while the springs remain connected to the body of the sheet by tie tabs, comprising:

positioning the sheet in a preform fixture having internal parts constructed to simultaneously displace each inner ring of each spring relative to its outer ring by a predetermined distance; and

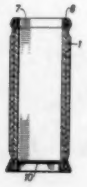
heat treating the fixture with the sheet therein, thereby causing the simultaneous preforming of the spider springs whereby each inner ring is permanently displaced from its outer ring.

4,400,862

METHOD OF MANUFACTURING PACKING CONTAINERS

Rolf L. Ignell, Grilly, France, assignor to Tetra Pak Developpement SA, Switzerland

Division of Ser. No. 64,920, Aug. 8, 1979, Pat. No. 4,281,769.
This application Mar. 9, 1981, Ser. No. 241,548
Claims priority, application Sweden, Aug. 11, 1978, 7808571
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—421 R **9 Claims**



8. A method for the manufacture of a packing container comprising:

providing a tubular blank of a longitudinally oriented plastic material having first and second ends and also having a wall thickness greater than the desired wall thickness of the packing container to be produced therefrom;

attaching a metallic end wall member to said first end of the tubular blank;

attaching a metallic annular ferrule to said second end of the tubular blank; and

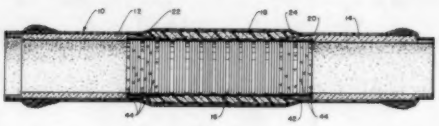
blow-molding said tubular blank to form a packing container of the desired configuration, a pressurized fluid being introduced into said blank through said second end during said blow-molding process, said end wall member and said annular ferrule, which are attached to respective ends of said blank, not being expanded during the blow-molding of said tubular blank.

4,400,863

METHOD OF MAKING A RIGID FIBERGLASS DUCT HAVING AN INTEGRAL BENDABLE ELBOW

Clifford A. Schroeder, Westlake Village, Calif., assignor to C.A. Schroeder, Inc., San Fernando, Calif.

Filed Nov. 2, 1981, Ser. No. 317,194
Int. Cl.³ B23P *11/02*; B31C *13/00*
U.S. Cl. 29—450 **15 Claims**



1. A method of making a rigid fiberglass duct having an integral bendable elbow comprising:

positioning a bendable elbow on a mandrel;

wrapping the mandrel and adjacent ends of said elbow with uncured fiberglass;

said uncured fiberglass overlapping only the ends of said bendable elbow;

compressing the overlapping portions of the uncured fiberglass;

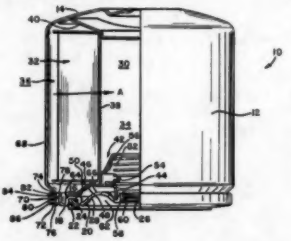
heating the assembled fiberglass and bendable elbow to cure and compact the fiberglass until substantially rigid whereby the fiberglass becomes bonded to the bendable elbow.

4,400,864

FLUID FILTER

Richard H. Peyton, Berkley, Mass., and Donald I. Thornton, Warwick, R.I., assignors to Fram Corporation, Providence, R.I.

Division of Ser. No. 180,734, Aug. 25, 1980, Pat. No. 4,324,660.
This application Nov. 13, 1981, Ser. No. 321,310
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—508 **3 Claims**



1. A method of making an oil filter housing characterized by the steps of:

a. providing a cup-shaped housing member having an open end and a marginal edge defining the opening into said cup-shaped member;

b. forming a bead at the marginal edge of said cup-shaped member;

c. providing a stamped closure member consisting of a single member having a substantially uniform thickness and a pair of spaced apart annular flanges at the marginal edge thereof, said pair of flanges extending substantially perpendicularly to the plane of said closure member and defining an annular bead-receiving cavity;

d. forming the first of said pair of annular flanges by bending

the marginal edge of the closure member so that it extends perpendicularly to the plane of said closure member and then ending said edge back on itself;

e. placing said cup-shaped member marginal edge between said pair of annular flanges and placing said bead in said annular cavity whereby said closure member closes said opening; and

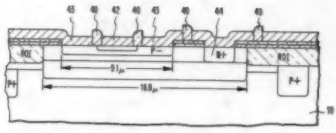
f. crimping the outermost of said flanges into permanent fluid-tight engagement with the bead of the marginal edge of said cup-shaped member.

4,400,865

SELF-ALIGNED METAL PROCESS FOR INTEGRATED CIRCUIT METALLIZATION

George R. Goth, Poughkeepsie; Ingrid E. Magdo, Hopewell Junction, and Shashi D. Malaviya, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 8, 1980, Ser. No. 167,184
Int. Cl.³ H01L *21/22, 21/28*
U.S. Cl. 29—571 **43 Claims**



1. A method for forming integrated circuits having a pattern of narrow dimensioned dielectric regions on a monocrystalline suitably doped semiconductor body which separates portions of the conductive layer making the first level contacts to said body comprising:

providing said semiconductor body;

forming a first insulating layer on a major surface of said body;

forming on said layer a polycrystalline silicon layer;

forming openings in said polycrystalline silicon layer by reactive ion etching which results in the structure having substantially horizontal surfaces and substantially vertical surfaces;

forming a second insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;

reactive ion etching said second insulating layer to substantially remove said second insulating layer from said horizontal surfaces and to provide said narrow dimensioned dielectric regions on said semiconductor body;

removing the said polycrystalline silicon layer by etching to leave said narrow dimensioned regions on said semiconductor body; and

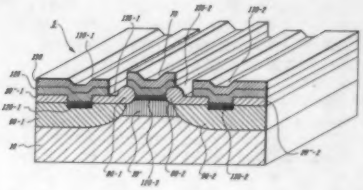
forming a conductive layer on said semiconductor body which has portions thereof electrically separated by said narrow dimensioned regions for contacting in self-alignment regions of said integrated circuits; wherein the said forming a conductive layer includes depositing a blanket layer of conductive material having a thickness of at least about that of the height of the narrow dimensioned regions over said narrow dimensioned regions and areas in between, blanket depositing a plastic material over the said conductive layer to planarize the surface, reactive ion etching the said plastic material and said conductive layer until the tops of said narrow dimensioned regions are reached and removing the remaining said plastic material to thereby form said portions of the conductive layer separated by said narrow dimensioned regions.

4,400,866

APPLICATION OF GROWN OXIDE BUMPER INSULATORS TO A HIGH-SPEED VLSI SASMESFET

Keming W. Yeh, Los Angeles, and Izya Bol, Hawthorne, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 121,622, Feb. 14, 1980, Pat. No. 4,375,643. This application Apr. 5, 1982, Ser. No. 365,859
Int. Cl.³ H01L *21/24*
U.S. Cl. 29—571 **11 Claims**



1. A controllable method of making a VLSI SASMESFET structure having a substrate with an implanted channel, an initial oxide layer disposed on the implanted channel of the substrate, a layer of polysilicon doped with phosphorus disposed on the initial substrate oxide layer coincident with an area defined for a Schottky gate, a silicon nitride layer disposed on the polysilicon layer, and source and drain areas implanted in the substrate on either side of the area defined for the Schottky gate, comprising the steps of:

a. oxidizing the polysilicon layer at a rate determined by the doping level and thickness at a predetermined temperature thereof to form oxide insulating bumpers at the ends of the polysilicon layer where the width of the oxide bumpers so formed determined the minimal source-to-gate and drain-to-gate separations for reduced series resistance therebetween; and

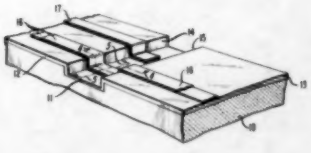
b. etching away of the silicon nitride layer, the polysilicon layer and the initial silicon dioxide layer to expose the implanted channel in the area that defines the Schottky gate.

4,400,867

HIGH CONDUCTIVITY METALLIZATION FOR SEMICONDUCTOR INTEGRATED CIRCUITS

David B. Fraser, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 26, 1982, Ser. No. 372,177
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—571 **16 Claims**



1. A method for simultaneously patterning high conductivity metal silicide electrode metallization overlying field oxide, gate oxide, and sidewall oxide, for semiconductor integrated circuits including the steps of:

(a) forming an unpatterned polysilicon layer everywhere simultaneously on exposed top surfaces of said field oxide, and gate oxide, and said sidewall oxide;

(b) forming a patterned resist layer on the polysilicon layer;

(c) depositing a layer of the metal silicide over then exposed

portions of the top surfaces of said resist layer and of said unpatterned polysilicon layer;

(d) removing the patterned resist layer to lift off metal silicide thereon, leaving intact a correspondingly patterned layer of said metal silicide on said polysilicon layer; and

(e) oxidizing exposed portions of the polysilicon layer to form an exposed layer of silicon dioxide whereby a correspondingly patterned polysilicon layer remains underlying said patterned layer of metal silicide.

4,400,868

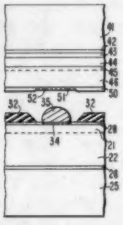
METHOD OF MAKING A TRANSPARENT AND ELECTRICALLY CONDUCTIVE BOND

George A. Antypas, Los Altos; Ronald L. Bell, Woodside, and Ronald L. Moon, Atherton, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 221,100, Dec. 29, 1980, Pat. No. 4,338,480. This application Feb. 24, 1982, Ser. No. 351,707

Int. Cl.³ H01L *21/283, 31/04*

U.S. Cl. 29—572 **8 Claims**



1. A method of making an electrically conductive and electomagnetically transparent bond between two surfaces of solar cells which are stacked together to form a multijunction photovoltaic converter, said method comprising the steps of:

placing a glass layer over a portion of a first surface leaving certain areas thereof uncovered by said glass layer,

depositing a metallizing layer on said certain areas on said first surface,

bonding an electrically conductive contact on said metallizing layer, and

bonding a second surface both to said contact and to said glass layer.

4,400,869

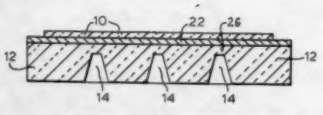
PROCESS FOR PRODUCING HIGH TEMPERATURE PRESSURE TRANSDUCERS AND SEMICONDUCTORS

L. Bruce Wilner, Palo Alto, and Herbert V. Wong, San Francisco, both of Calif., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Feb. 12, 1981, Ser. No. 233,728

Int. Cl.³ H01L *21/225, 29/84*

U.S. Cl. 29—576 C **16 Claims**



1. A process for producing high temperature pressure transducers, comprising the steps of

(a) selecting a diaphragm wafer;

(b) selecting a gauge wafer;

(c) depositing in a first depositing step a boron rich layer on one surface of said gauge layer;

the improvement characterized by

(d) depositing in a second depositing step silicon dioxide on one surface of said diaphragm layer;

(e) orienting said diaphragm wafer with said gauge wafer so that said boron rich layer is adjacent said silicon dioxide layer;

(f) subjecting in a first subjecting step said oriented wafers to temperature and pressure conditions sufficient to cause adhesion between said boron rich layer and said silicon dioxide layer;

(g) said first subjecting step is carried out in a press first at a pressure at about two pounds per square inch for a time sufficient to elevate said temperature to an adhesion temperature above the melting temperature of said boron rich layer;

(h) said first subjecting step is carried out secondly by maintaining said elevated temperature for six hours at an elevated pressure within the range of between about above two and sixty pounds per square inch;

(i) subjecting in a second subjecting step said oriented wafers to temperature conditions sufficient to simultaneously diffuse said boron rich layer into both said gauge wafer and said silicon dioxide layer on said diaphragm wafer;

(j) removing a substantial portion of said gauge wafer from the surface thereof opposite said diaphragm wafer to provide a boron rich gauge wafer film;

(k) said removing step including preferentially etching said gauge wafer to a uniform thickness; and

(l) said uniform thickness is within the range of between about 5×10^{19} and 1×10^{20} atoms of boron per cubic centimeter of remaining gauge film.

4,400,870

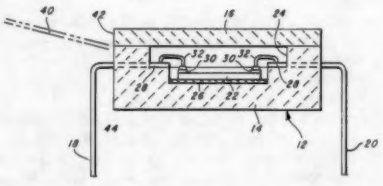
METHOD OF HERMETICALLY ENCAPSULATING A SEMICONDUCTOR DEVICE BY LASER IRRADIATION

Safidul Islam, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 6, 1980, Ser. No. 194,108

Int. Cl.³ H01L *21/52*

U.S. Cl. 29—588 **4 Claims**



1. A method of hermetically sealing a semiconductor chip within a package comprising:

providing a first ceramic member having a plurality of conductive paths hermetically sealed therein;

providing a plurality of electrically conductive leads for making external connections to the conductive paths;

bonding a semiconductor chip to a surface of the first ceramic member;

forming electrical connections between regions of the semiconductor chip and the conductive paths;

providing a second ceramic member in abutting relationship with portions of the first ceramic member so as to define a compartment therebetween in which the semiconductor chip resides; and

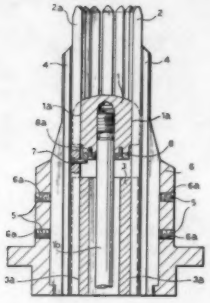
exposing adjacent edges of the first and second ceramic members to a laser beam for a sufficient duration to fuse the adjacent edges together throughout a closed loop so as to hermetically seal the compartment from the surrounding atmosphere.

4,400,871

METHOD FOR PLACING PREWOUND COILS IN STATOR SLOTS

Giorgio Barrera, Turin, Italy, assignor to Officine Meccaniche Pavesi & C. S.p.A., Cascine Vica, Italy

Division of Ser. No. 77,529, Sep. 27, 1979, Pat. No. 4,304,045. This application Jun. 29, 1981, Ser. No. 278,070
Claims priority, application Italy, Oct. 24, 1978, 69440 A/78
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—596 3 Claims



1. A method for the insertion of prewound coils into stator slots of a stator of a rotary electric machine; the method including using a cylindrical finger holder having a series of longitudinal grooves on its periphery and an annular series of single piece fingers carried in the grooves of the finger holder and extending beyond one end of the finger holder to receive the prewound coils between certain ones of the fingers, annularly positioning the finger holder and stator in order to align the prewound coils carried by the fingers with the slots of the stator, and transferring the prewound coils from the fingers to the stator slots, with the improvements comprising: utilizing friction created between the coils and the fingers caused by relative movement of the coils and the fingers to assist in the step of transferring the prewound coils from the fingers to the stator slots while moving at least some of the fingers axially with their respective prewound coils wherein at least some of the fingers are freely slidable, the step of transferring includes advancing a stripper member to engage the coils and urge them into the stator slots, and the step of utilizing friction includes utilizing the friction between the coils and the fingers to move the at least some fingers; and wherein there is included the steps of retracting the stripper member, and engaging the stripper member with projections on the freely slidable fingers to return the fingers with the stripper member.

4,400,872

METHOD OF AND APPARATUS FOR SKEWING A STACK OF LAMINATIONS

David E. Berges, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

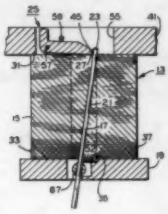
Filed Aug. 13, 1981, Ser. No. 292,526
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 20 Claims

2. A method of operating apparatus for skewing a stack of laminations with the stack including a pair of opposite ends, a peripheral portion between the opposite ends, at least one opening between the opposite ends and at least adjacent the peripheral portion, and a generally central opening between the opposite ends, the apparatus including a base plate, at least one skewing pin pivotally mounted with the base plate so as to be pivotally movable between an at-rest position and a displaced position, a pressure pad, and at least one cam pivotally mounted to the pressure pad, the method comprising the steps of:

seating one of the opposite ends of the stack on the base plate and extending the at least one skewing pin through the at least one opening with the free end of the at least one skewing pin protruding from the at least one opening beyond the other of the opposite ends of the stack;

advancing the pressure pad in a direction generally toward the other opposite end of the stack when the stack is seated on the base plate; and

engaging the at least one cam with the other opposite end of the stack at least generally adjacent the free end of the at least one skewing pin protruding therebeyond and pivoting the at least one cam about the pivotal mounting thereof with the pressure pad into driving engagement with the free end of the at least one skewing pin to displace the at least one skewing pin from the at-rest position toward the displaced position thereof effecting the skewing of at least some of the laminations of the stack through the engagement therewith of the at least one skewing pin within the at least one opeming at least as the pressure pad is advanced toward the other opposite end of the stack.

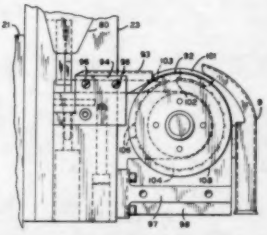


4,400,873

APPARATUS FOR USE IN MAKING ELECTRICAL INTERCONNECTIONS

Alan L. Kindig, and Albert J. Wesseldyk, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 85,992, Oct. 18, 1979. This application Dec. 10, 1981, Ser. No. 329,577
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—753 3 Claims



1. An apparatus for making an electrical interconnection with at least one magnet wire segment extending from a winding supported on a core of a dynamoelectric machine; wherein the interconnection comprises a splice connector crimped upon the at least one magnet wire segment and at least one other wire segment; wherein the at least one magnet wire segment, the at least one other wire segment, and an uncrimped splice connector are positioned at a crimping station; and wherein the apparatus includes means for intermittently advancing uncrimped splice connectors to the crimping station by pushing the uncrimped connectors thereinto; the improvement wherein: the means for advancing uncrimped splice connectors to the crimping station comprises a rotary wheel

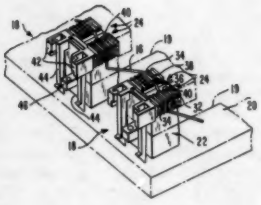
feed assembly having an intermittently driven feed wheel having a plurality of spaced apart teeth thereon, means for holding spliced connectors against the periphery of the toothed wheel, and a feed track arranged to guide splice connectors pushed off of and from the toothed feed wheel to the connecting station said apparatus including a tongue disposed in close proximity to the toothed wheel and constituting means for insuring that splice connectors are stripped from the toothed wheel as they are pushed toward said feed track from the toothed wheel.

4,400,874

WIRING CONNECTOR PLUGS TO PRODUCE A WIRE MULT

Edward H. Craver, Clemmons, and Samuel Pinnolis, Winston-Salem, both of N.C., assignors to Western Electric Company, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,438
Int. Cl.³ H01R *43/00*; B23P *19/00*
U.S. Cl. 29—861 **17 Claims**



1. A method of wiring first and second connector plugs to produce a wire mult, which comprises the steps of:

(1) inserting a first portion of a wire into a terminal of the first connector plug;

(2) forming a slack portion in the wire between the first connector plug and the second connector plug; and

(3) inserting a second portion of the wire into a strain-relief slot of the first connector plug after the first portion of the wire has been inserted in the terminal of the first connector plug.

7. Apparatus for wiring connector plugs to produce a wire mult, which comprises:

first insertion means for inserting a first portion of a wire into a terminal of a first connector plug;

means for forming a slack portion in the wire between the first connector plug and a second connector plug after the first portion of the wire has been inserted into the terminal of the first connector plug; and

second insertion means for inserting a second portion of the wire into a wire strain-relief slot in the first connector plug after the first portion of the wire has been inserted into the terminal of the first connector plug.

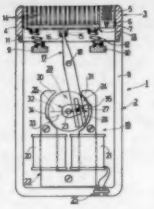
4,400,875

DRY-SHAVING APPARATUS

Leo Buzzi, and Romuald L. Bukoschek, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,734
Claims priority, application Austria, Jul. 28, 1980, 3922/80
Int. Cl.³ B26B *19/28, 19/04*
U.S. Cl. 30—43.92 **7 Claims**

1. A dry-shaving apparatus for connection to an a.c. source, which comprises at least one reciprocatory cutter; a self-starting single-phase synchronous motor having a drive spindle; and at least one drive mechanism coupling the drive spindle to the cutter for converting the rotary movement of the drive spindle into a reciprocating movement of the cutter; the relative position of the motor rotor about its axis with respect to the position of the cutter being selected so that in any rotor position in which the driving torque of the motor has zero



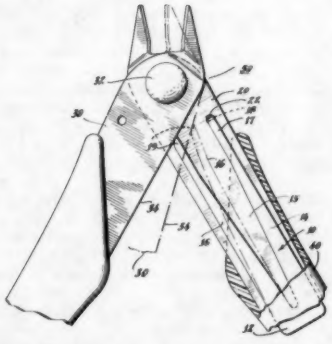
value the cutter substantially occupies one of the two extreme positions in its reciprocating movement.

4,400,876

SPRING DEVICES

Frank R. Brown, Brookfield, Conn. 06804

Filed Oct. 26, 1981, Ser. No. 315,013
Int. Cl.³ B26B *13/16*
U.S. Cl. 30—186 **11 Claims**



7. A hand tool comprising

two handle members pivotally mounted to each other, and a spring device for imparting spring bias against the movement of said members toward each other, said spring device comprising

a flat continuum made from springy material having a base portion from which two elongated arms, each of which is wider at its base portion end than at its outermost end, and is separated from the other by a V-shaped slot, extend in substantially the same direction with respect to said base portion, the end region of one of said arms farthest from said base portion being adapted for affixation to the member with which it is to be associated, and the end region of the other of said arms that is farthest from said base portion being adapted to receive pressure laterally on the side thereof facing away from the other of said arms from being impinged upon by the other of said members.

4,400,877

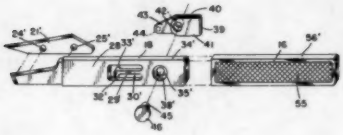
THREAD NIP

Clair H. Gingher, Jr., Greensboro, N.C., assignor to Gingher, Inc., Greensboro, N.C.

Filed Jan. 11, 1982, Ser. No. 338,431
Int. Cl.³ B26B *13/16*
U.S. Cl. 30—253 **7 Claims**

1. A thread nip comprising; a pair of blade-retaining handles

positioned against each other, each said handle having a blade-receiving portion, an intermediate portion having an opening therein and a spring biasing member extending into said opening, and a rear pivot portion having a pivot pin-receiving opening therein, a pivot assembly means pivotally joining said handles together retained in said pivot pin-receiving opening,



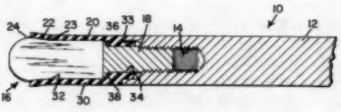
said spring biasing member cooperatively aligned to urge said handles to pivot about said pivot assembly means in an open mode and to bias said blades to separate in a closed mode, and a blade mounted on each of said blade-receiving portions for cooperative cutting engagement from the open to the closed mode.

4,400,878

KNIFE BLADE HOLDER

Richard E. Vaudreuil, Shrewsbury, Mass., assignor to G & S Screw Machine Products, Inc., Worcester, Mass.

Filed Oct. 5, 1981, Ser. No. 308,477
Int. Cl.³ B26B *1/00*
U.S. Cl. 30—329 **6 Claims**



1. Holder for interchangeable knife blade, comprising:
(a) a handle which has a threaded bore at one end,
(b) a chuck which has a forward portion and a rearward portion, the rewarward portion being adapted for threading into said bore, the forward portion being bifurcated to define a lengthwise slot for receiving a flat cutting blade, said chuck having an external cam surface adjacent the forward end of said forward portion, said cam surface tapering outwardly toward said forward end to a major dimension, and
(c) a tubular elastomeric ferrule mounted on the chuck for longitudinal sliding movement relative to the chuck, said ferrule extending between the handle and the cam surface when the chuck is partially threaded into the bore so that additional threading of the chuck into the bore causes the ferrule to slide forwardly over the cam surface, the inner dimension of said ferrule being substantially less than said major dimension, so that the ferrule is stretched as it approaches said major dimension, thereby transmitting a clamping pressure against a blade which is located in the slot.

4,400,879

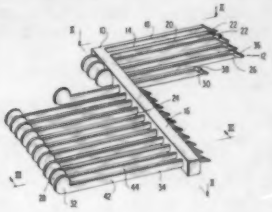
HAIR SECTIONING TOOL

Michael S. Hildreth, 2206 Noble Oaks Dr., Savannah, Ga. 31406

Filed Jul. 13, 1981, Ser. No. 282,900
Int. Cl.³ A45D *24/36*
U.S. Cl. 132—151 **24 Claims**

1. A hair sectioning tool to divide the hair on a person's head into a plurality of sections to facilitate the manipulation thereof comprising

a base member having first and second substantially perpendicular legs, said first leg having means to engage a portion of said hair to retain said base member in a desired position on said head, and



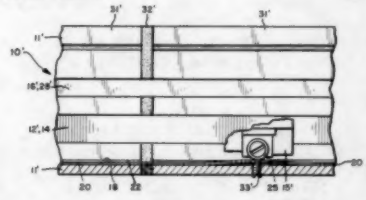
a plurality of finger means individually movably mounted on said second leg of said base member for movement between a first position in which said finger means are side-by-side one another to a second position in which said finger means are not side-by-side fingers in said first position.

4,400,880

PRECISION MEASURING APPARATUS

Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,971
Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016908
Int. Cl.³ G01B *11/04*
U.S. Cl. 33—125 C **10 Claims**



1. In a precision measuring apparatus comprising a measuring scale extending along a measuring direction, a scanning unit for scanning the scale, and a housing for supporting the scale and the scanning unit, the improvement comprising:
at least one flexible band each defining a guide surface for guiding the scanning unit, said band being deflectable in a direction perpendicular to the measuring direction; and
means, included in the housing, for defining at least one groove adapted to carry the at least one flexible band.

4,400,881

APPARATUS FOR LOCATING THE LEVEL OF LIQUID IN A VESSEL

Daniel Boudin, Orleans; Jean Godat, Olivet; Alain Krzywdziak, Saint Denis en Val, and Daniel Parmenon, Orleans la Source, all of France, assignors to Fonderie et Ateliers des Sablons, Orleans, France

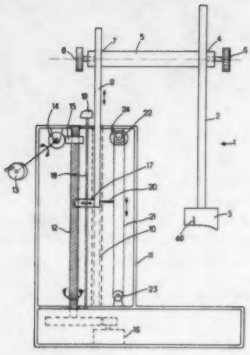
Filed Jan. 29, 1981, Ser. No. 230,044
Claims priority, application France, Feb. 19, 1980, 80 03569
Int. Cl.³ G01F *23/04*
U.S. Cl. 33—126.7 A **10 Claims**

1. Level locating apparatus which comprises:
a probe having a level detector at its lower end which is

provided with a means for adjusting the height of said probe, mounted upon a support element integral with a vertical column sliding axially in a slide fixed in the body of said apparatus;

a vertical threaded rod rotatably mounted on said body near said column and capable of being driven in rotation by means of a manually controllable drive mechanism;

a releasable nut axially integral with said column and which, by the action of a control device, can take two positions, namely:



an engaged position in which the threads of the nut work together with the threading of a threaded rod so as to achieve an axial movement of the column when the threaded rod is rotated;

a disengaged position in which the threads of the nut are away from the threading of the threaded rod, this disengaged position permitting free sliding of the column in its slide; and,

a driving apparatus assuring the control of a potentiometer as a function of the position of said column.

4,400,882

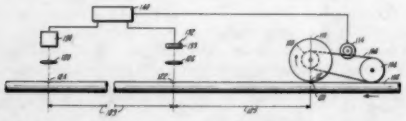
SYSTEM FOR MEASURING CABLE FOOTAGE

Robert K. Thornton, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 31, 1981, Ser. No. 288,722

Int. Cl.³ G01B 5/04, 11/04

U.S. Cl. 33—127 **2 Claims**



1. An apparatus for marking cables during manufacturing comprising:

marking means comprising a printing wheel rotating adjacent said cable at a variable speed, for repetitively imposing length marks, having a variable spacing therebetween, on a cable;

means for measuring the actual distance between selected ones of said length marks on said cable;

means for computing the deviation of said actual length from a reference length;

controlling means responsive to said means for computing for controlling said variable speed of said printing wheel in said marking means to vary said variable spacing in such a manner as to compensate for said deviation.

4,400,883

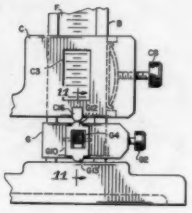
SURFACE LAYOUT GAUGE

Walter B. Champlin, P.O. Box 94, Wickenburg, Ariz. 85358

Filed Jul. 16, 1981, Ser. No. 283,893

Int. Cl.³ G01B 3/20

U.S. Cl. 33—169 R **3 Claims**



1. A layout gauge comprising:

a base,

a column rising therefrom,

a slide on said column,

a scale vertically slidable in a groove in said column,

a strap to which the lower end of said scale is attached surrounding and slidable on said column,

clamping means for holding said strap in different positions of adjustment, an indicator arm projecting laterally from said slide,

cooperating members on said slide and scale adapted when in contact to register the zero marking on the scale with an index on the slide,

said strap when lowered to rest on said base positioning said scale so as to give a direct reading of the total height of the indicator above the supporting plane for the base in each position of adjustment of said slide,

lever means pivotally mounted on said strap for engaging the surface of said column for vertically moving said scale for fine adjustments,

said lever means having one end thereof extending through an aperture in said scale to frictionally engage the surface of said column and with the other end of said lever being provided with a knurled surface for receiving thumb pressure of the user for making fine adjustments of said scale, and

said slide further comprising spring means for applying frictional pressure to said column,

said spring means comprising a gib in sliding engagement with said column, a spring mounted within said gib and an adjustment means for selectively increasing or decreasing the pressure on said spring to increase or decrease the friction between said slide and column.

4,400,884

SKIN CONTOUR INSPECTION SYSTEM

Joseph M. Baresh, Seattle; Elmer Hisey, Bellevue, and Robert E. Nash, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

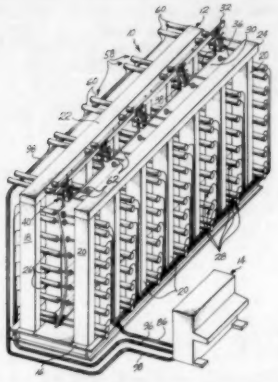
Filed Oct. 2, 1980, Ser. No. 193,326

Int. Cl.³ G01B 7/28

U.S. Cl. 33—174 PA **7 Claims**

1. An apparatus for checking the contour of a formed skin comprising: a pair of spaced apart vertical structures, a plurality of probes mounted to extend laterally from one of the structures toward the second structure, means for controlling the outwardly extending distance of each probe to in combination with the ends of the probes defining the contour of a skin to be checked, means for suspending a formed skin in essentially a vertical position adjacent the positioned probes, an equal number of a second set of probes axially aligned with the first set of probes and reciprocally movable to extend from the second structure toward the first set of probes, means for

controlling the advance of the second set of probes to exert a predetermined pressure to force the formed skin against the first set of probes, and means for determining the amount and location of any out of tolerance part of the formed skin, wherein the means for suspending the formed skin comprises:



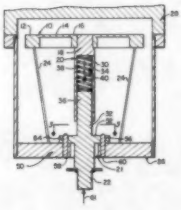
a series of hangers spaced along and connected to an upper edge of the formed skin, a longitudinally extending horizontal rod to extend on each side of each hanger, means for supporting under each rod to suspend the skin while permitting movement in response to the advance of the second set of probes.

4,400,885

LOCKING SYSTEM FOR A REMOTE CENTER COMPLIANCE DEVICE

Emanuel J. Consales, Winchester, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jul. 9, 1981, Ser. No. 281,659
Int. Cl.³ G01B 5/25
U.S. Cl. 33—185 R **11 Claims**



1. A lockable remote center compliance (RCC) device comprising:

a deformable structure;

an operator member having a first section attached to said deformable structure and a second section incorporating the free end of said operator member;

means for supporting said deformable structure including:

frame means proximate the free end of said operator member;

locking means including first and second parts carried one by said second section of said operator member and the other by said frame means for releasably securing said operator member to said frame means; and

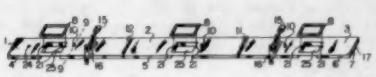
means for moving said sections relative to one another to engage said first part of said locking means with said second part to secure the free end of the operator member against compliant action.

4,400,886

DOOR AND JAMB MORTISING PILOT

Lyle D. Bindschatel, 303 Holiday Lake Dr. East, Holiday, Fla. 33590

Filed Apr. 24, 1981, Ser. No. 257,396
Int. Cl.³ B27G 17/08
U.S. Cl. 33—197 **8 Claims**



1. A door and jamb mortising pilot means, comprising, in combination, an elongate door and jamb pilot means of articulated construction,

a plurality of mortising openings or apertures formed in said pilot means at pre-determined positions corresponding to the respective positions of hinge recesses to be formed,

a plurality of interchangeble mortising guide template means,

positioning means for positioning said template means in operative registration with each of said mortising openings formed in said pilot means,

said positioning means including registration pin means provided as part of said template means,

said positioning means further including aperture means formed in said pilot means for slidably receiving said registration pin means,

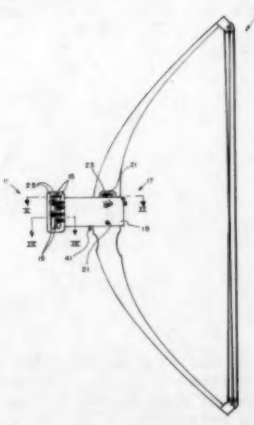
and a biased locking means to maintain said template means in their respective operative positions when said apparatus is in use.

4,400,887

ARCHERY BOW SIGHT

John D. Mason, 4115 Silverleaf Cove, Memphis, Tenn. 38115

Filed Jul. 16, 1981, Ser. No. 284,456
Int. Cl.³ F41G 1/32
U.S. Cl. 33—265 **7 Claims**



1. The combination with an archery bow of a bow sight for aiding an archer in aiming the bow at a target from an elevated shooting position, said bow sight comprising:

(a) a plurality of sight means for being mounted on the bow and for selective use by the archer in sighting on the target;

(b) control means for causing a specific one of said sight means to be readily distinguishable from the other of said sight means, said control means including means respon-

sive to the angle in which the bow is held and for causing a specific one of said sight means to be readily distinguishable from the other of said sight means depending on the angle in which the bow is held.

4,400,888

INSTRUMENT FOR LEVELLING

Yngve Ström, Furuvägen 6, 183 67 Täby, Sweden

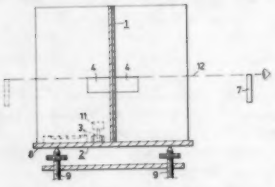
PCT No. PCT/SE81/00018, § 371 Date Sep. 29, 1981, § 102(e) Date Sep. 29, 1981, PCT Pub. No. WO81/02200, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 23, 1981, Ser. No. 308,535

Claims priority, application Sweden, Jan. 31, 1980, 8000755

Int. Cl.³ G01C *15/02*; G02B *5/08*

U.S. Cl. 33—295 **1 Claim**



1. An instrument for use when levelling, said instrument comprising: upright mirrors which intersect each other at right angles; a frame structure on which said mirrors are carried, said frame structure including means for adjusting said mirrors relative to the horizontal plane; said mirrors having markings defining lines located on the same level relative to a plane which forms right angles with all mirror surfaces.

4,400,889

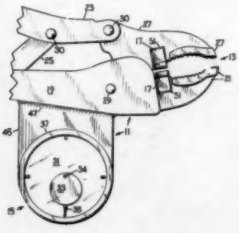
QUICK-CLAMP GAUGE FOR MONITORING PIPE BENDING

Gerald T. Busey, 913 W. Chambers, Jacksonville, Ill. 62650

Filed Jun. 29, 1979, Ser. No. 53,189

Int. Cl.³ G01C *9/12*

U.S. Cl. 33—372 **5 Claims**



1. A pipe-bend gauge for monitoring the bending of a pipe in a fixed-plane pipe-bender, comprising: a clamp having a pair of pivotally connected jaws, adjustable dead-center means for quickly closing and securely holding said jaws in clamping engagement with the rim of a pipe end with one jaw longitudinally disposed within said pipe, and an adjustable clinometer unit fixed to said clamp with its tilt-indicating axis substantially parallel to the axis of the pivot of said pair of jaws, said clinometer unit having a degree-graduated flat dial adjustably rotatable about a horizontal axis and having a pendulum-type indicator connected to said dial for swinging about said horizontal axis, each of said pair of jaws having an auxiliary jaw extending therefrom and substantially parallel to the pivot axis of said pair of jaws whereby said gauge can be connected to said pipe with its dial lying substantially in a plane either parallel to or perpendicular to the axis of said pipe.

4,400,890

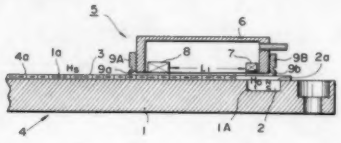
LENGTH MEASURING DEVICE

Hiroyuki Ohkubo, Chiba; Hiroshi Maru, Oomiya; Yoshito Kato, Aichi, and Toshio Hashimoto, Toyota, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 314,775

Int. Cl.³ G01B *7/02*; G06M *3/06*

U.S. Cl. 33—125 C **7 Claims**



1. A length measuring device comprising a magnetic scale body including at least one origin signal magnetic section and a measurement signal magnetic section forming a magnetic grating, said magnetic scale body having a uniform frictional surface formed over the entire effective length of said scale body, and a detecting head body including an origin detecting head for detecting an origin signal and a measurement detecting head for detecting a measurement signal and provided with scraper means in elastic contact with said frictional surface of said magnetic scale body, said detecting head body being moved relative to said magnetic scale body along said length of the latter.

4,400,891

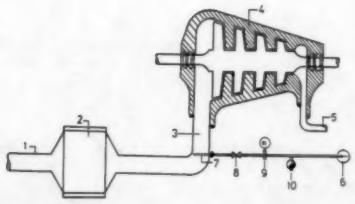
STEAM CLEANING SYSTEM FOR PROCESS EQUIPMENT AND COMPRESSORS

Gunnar Kongshaug, Porsgrunn, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

Division of Ser. No. 136,070, Mar. 28, 1980, Pat. No. 4,294,895. This application Jun. 1, 1981, Ser. No. 268,655

Int. Cl.³ F26B *19/00*

U.S. Cl. 34—85 **16 Claims**



1. In a processing apparatus for the transportation and compression of process gases containing salt impurities, the improvement comprising:

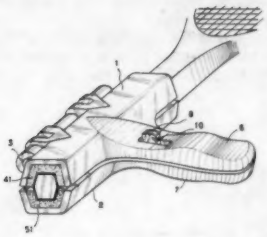
means for removing and preventing the formation of salt deposits in critical sections of said processing apparatus where the process gases containing the salt impurities are being transported and compressed, said removing and preventing means comprising means for supplying steam to said sections in such amounts that a water vapor pressure is established in excess of the saturated water vapor pressure above the salt deposits at the existing temperatures.

4,400,892

TONGS HAVING A REMOVABLE ABSORBENT LINING FOR DRYING THE HANDLES OF TENNIS RACKETS AND SIMILAR

Jacques Tebaldi, 34 route de Tours, 41400 Saint Georges Sur Cher, France

Filed Jun. 3, 1981, Ser. No. 270,067
Claims priority, application France, Jun. 4, 1980, 80 12421
Int. Cl.³ B43L 17/04
U.S. Cl. 34—95.1 5 Claims



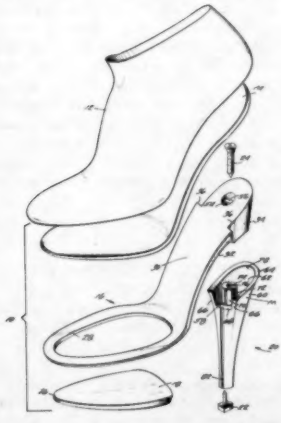
1. A device for drying racket handles, said device comprising two substantially identical jaws (1, 2) hinged about a common pin (3) and each extended by a handle forming a lever (6, 7), these jaws together defining an elongated cavity (4, 5) opened at both ends, an absorbent lining being housed in said cavity and said cavity being so shaped as to accomodate a substantial portion of the length of a racket handle.

4,400,893

SHOE WITH REMOVABLY-MOUNTED HEEL

Nicola Musci, Caracas, Venezuela, assignor to Fratelli Musci, Caracas, Venezuela

Filed Sep. 9, 1981, Ser. No. 300,515
Int. Cl.³ A43B 13/28, 21/36
U.S. Cl. 36—24.5 7 Claims



1. A shoe comprising:

a heel-needing sole member made of semi-rigid molded plastic material including a thickened heel stub portion having a generally vertically downwardly projecting, downwardly tapering outer perimetrical sidewall extending about both lateral sides and the back thereof, said heel stub portion including a generally flat lower end wall having a downwardly opening centrally located generally cylindrical socket;

a heel member including a generally upright body having means providing an upwardly opening recess providing a sidewall shell which extends about at least the lateral sides and back of the body, said shell having an upper rim, said recess having a generally horizontal floor that is centrally provided with an axially upwardly projecting generally cylindrical boss with a generally horizontal, flat upper end lying below said rim, said shell having a downwardly tapering internal surface which matches said downwardly tapering outer perimetrical sidewall of said sole member; and

means removably securing said heel member to said heel-needing sole member with said generally cylindrical boss snuggly received in said generally cylindrical socket and said heel stub portion received on the lateral sides and back within said shell, with said downwardly tapering internal surface of said shell in extensive engagement with said downwardly tapering outer perimetrical sidewall of said sole member;

said shell including generally vertical left and right forwardly facing front rims adjoining said upper rim thereof;

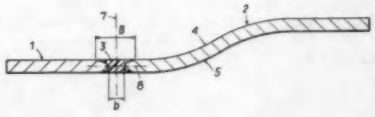
said heel-needing sole member including generally vertical left and right rearwardly facing shoulders respectively confronting said left and right front rims.

4,400,894

SOLE CONSTRUCTION FOR SHOES

Johann Ehrlich, Schulgasse 3, A-3500 Krems, Weinzierl, Austria

Filed Sep. 26, 1980, Ser. No. 191,066
Claims priority, application Austria, Sep. 28, 1979, 6382/79
Int. Cl.³ A43B 13/08, 13/14
U.S. Cl. 36—33 9 Claims



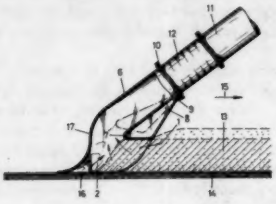
1. A sole construction for shoes, comprising at least two independently prefabricated parts formed of a wood material, said wood parts being interconnected to each other at an area that is located beneath the ball of the foot of the wearer by at least one flexible intermediate part that consists of foamed polyurethane, said intermediate part including a first outer portion located adjacent to the sole of the wearer's foot, a second outer portion located adjacent to the walking surface of said sole and a middle neck portion disposed beneath said first and second outer portions, the width of said intermediate part as measured in the longitudinal direction of said sole being greater at the marginal areas of said first and second outer portions than at the smallest width of said middle neck portion, the interfacing surfaces between said wood parts and said intermediate part being free from sharp edges, the upper portions of said interfacing surfaces tapering gradually arcuately upwardly and outwardly from said middle portion to the marginal areas of said first and second outer portions, and the portions of said interfacing surfaces in the marginal areas adjacent to the surface supporting the sole of the wearer's foot each being tangent to said latter surface without forming a step therewith.

4,400,895

DRAG HEAD FOR A HOPPER SUCTION DREDGE

Pieter Verboom, Alblasserdam, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Apr. 15, 1982, Ser. No. 368,817
Claims priority, application Netherlands, Apr. 15, 1981, 8101858
Int. Cl.³ E02F 3/88
U.S. Cl. 37—58 3 Claims



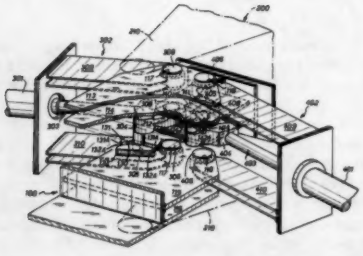
1. In a drag head for a hopper suction dredge, which drag head has a suction opening that opens in the dragging direction and which is defined only by an upper edge, two side walls and the soil to be dredged, and which has a rear wall which is closed and has its lower edge lower than the upper edge of the inlet and in the same plane as the lower edges of the side walls; the improvement in which the lower edge of the rear wall and the lower edges of the side walls are disposed in a common horizontal plane, said rear wall extending upwardly and forwardly in the dredging direction with an upwardly concave curvature followed by a reverse bend and a downwardly concave curvature, and which said drag head has an inlet body whose lower surface comprises said upper edge of the inlet, and means mounting said inlet body for vertical swinging movement on the drag head about a horizontal axis.

4,400,896

SWINGING DEVICE FOR DREDGER

Rene H. Jeanson, Auzay, France, assignor to VALEO, Paris, France

Filed Mar. 16, 1982, Ser. No. 358,804
Claims priority, application France, Mar. 25, 1981, 81 05956
Int. Cl.³ E02F 3/90
U.S. Cl. 37—67 10 Claims



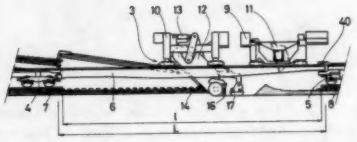
1. A swinging device for a dredger having an articulated dredging arm for movement between limit positions to opposite sides of a middle position, said swinging device comprising two jacks respectively disposed on opposite sides of said articulated dredging arm, each of said jacks having a jack body and a jack piston provided with a piston rod, a yoke extending from each of said jack bodies in the same direction as the associated piston rod, said yokes having means for pivotally mounting said jack bodies on a fixed part about respective axes, means pivotally connecting said piston rods to said dredging arm about respective axes, the pivot axes of said jack bodies on said fixed part being substantially coextensive with the pivot axes of the respective piston rods on said dredging arm in said middle position of said dredging arm, thereby increasing torque applied to said dredging arm in said positions.

4,400,897

METHOD AND RAILWAY TRAIN FOR DRAINING A RAILWAY TRACK

Fredy Scheuchzer, Lausanne, and Fritz Bühler, Ecublens, both of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 188,113, Sep. 17, 1980, Pat. No. 4,319,416. This application Mar. 1, 1982, Ser. No. 353,486
Claims priority, application European Pat. Off., Nov. 8, 1979, 79810147.3; Feb. 9, 1982, 82200150.9
Int. Cl.³ E01B 37/00
U.S. Cl. 37—104 11 Claims



1. Train for improving the drainage of a railway track comprising a working car consisting of a frame-car with an empty frame of a length in excess of the length of one track span, said car having two trucks rolling the rear one on the new track and the front one on the old track and, ahead of said frame-car, a set of carriages provided with equipments for loading the excavation and, at the rear of said frame-car, other cars for transporting the spans, the sand and the ballast, guide rails installed on said transport cars and said frame-car, two gantries adapted to roll on said guide rails installed on said transport cars and said frame-car, said gantries supporting hoisting means for lifting a span and means for handling buckets for transporting the sand and ballast, and a rolling truck also movable on said guide rails ahead of said two gantries and from which at least one vertically adjustable excavator is suspended, said excavator covering either the full width of the excavation or only a reduced width, and being movable laterally or adapted to pivot for excavating the ballast, a swivel-mounted digging device mounted at the rear of said excavator, and comprising an endless chain associated with helical transverse fins, said digging device being provided with hydraulic cylinders for moving same in a vertical plane and in a longitudinal plane, respectively, said digging device being so designed that it can dig to a depth greater than the excavation and covers the full excavation width.

4,400,898

BUCKET PIVOT ASSEMBLY

Robert B. Christensen, Kenosha, Wis., and Lee F. Kramer, Gurnee, Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

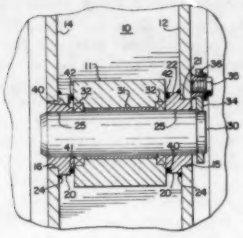
Filed Aug. 13, 1981, Ser. No. 292,454
Int. Cl.³ E02F 3/00; F16C 11/02
U.S. Cl. 37—118 A 3 Claims

1. In a loader bucket mounted for rotation about a loader arm assembly of an earth-working vehicle, means for mounting the bucket to the loader arm comprising:

a pair of transversely spaced plate-like brackets secured to the bucket in vertical orientation on either side of the loader arm and having axially aligned apertures respectively transverse of the bucket;

a pair of externally shouldered annular pin adapters welded respectively to each of said brackets and being disposed between said brackets and adjacent said loader arm, each of said pin adapters having a lesser outside diameter por-

tion of substantially the same diameter as and mounted in the respective bracket apertures, a larger diameter portion abutting the bracket, and a transversely extending pin bore of greater axial length than said aperture, said larger diameter portion of said pin adapter having a concave



indentation on the outer interior corner of said adapter, and a seal means interacting with said loader arm disposed in said indentation; and

a cylindrical pin mounted in non-rotating relationship in said pin bore of each of said pin adapters and extending through said loader arm assembly between said brackets.

4,400,899

ALBUM

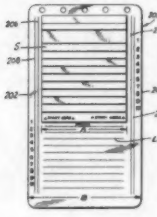
Eugene E. Martinez, Irvington-On-Hudson, N.Y., assignor to Robert H. Reibel, Croton-on-Hudson, N.Y.

Continuation-in-part of Ser. No. 767,503, Feb. 10, 1977, Pat. No. 4,106,230, and Ser. No. 928,878, Jul. 28, 1978, abandoned. This application Aug. 25, 1980, Ser. No. 180,596

The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.

Int. Cl.³ B42F *17/22*; G09F *19/00*; A47G *1/06*; G09F *7/12*

U.S. Cl. 40—391 **14 Claims**



1. An album for displaying sheet-like articles such as photographs and the like, comprising:

(a) an imperforate backing member having opposite major surfaces;

(b) at least one elongated rectilinear strip arranged on only one of said surfaces of said backing member, said strip including

(i) a stationary rectilinear section in fixed position on only said one backing surface,

(ii) a movable rectilinear section in one piece with said stationary section and having opposite surfaces, and

(iii) rectilinear hinge means interposed between said sections and operative for swinging the movable section relative to the stationary section about a rectilinear folding axis which extends lengthwise of the strip intermediate said sections between a display position in which one side of the sheet-like article is displayed, and a flipped-over position in which the opposite side of the sheet-like articles is displaced, said movable section being free of the surface of the backing member

(c) means firmly anchoring said stationary section on said only one surface of said backing member against a pulling removal force of a predetermined magnitude;

(d) adhesive means on the surface of said movable section which faces the backing member, said adhesive means being adhered to said one surface of said movable section against a pulling removal force of a given magnitude;

(e) a pull ribbon associated with and adjacent to said rectilinear strip, said pull ribbon including

(i) a peel-off section adhered to said one surface of said movable section on which said adhesive means is present, said peel-off section being adhered to said adhesive means against a pulling removal which is of a magnitude less than said predetermined and said given magnitudes, respectively, and

(ii) a handle section connected to and extending beyond said peel-off section and beyond said adhesive means, said handle section being manually grippable so that a user may grasp and pull said handle section to peel the peel-off section from the movable section, without pulling the strip off said backing member, and without detaching said adhesive means from said one surface of said movable section, to thereby expose said adhesive means on said one surface of said movable section and permit a user to manually attach to said freshly exposed adhesive means the sheet-like article to be displayed in either of said positions,

(f) said adhesive means being substantially completely covered by said peel-off section,

(g) said movable section, said peel-off section and said handle section being close to and spaced from said backing member, having substantially no exposed adhesive means, and forming a rectilinear wedge-shaped adhesive-free pocket defined by said backing member and said pull ribbon into which said sheet-like article may be freely inserted for positioning by placement of an edge of the article against the bottom of said pocket before the peel-off section is removed and the sheet-like article is adhered to the adhesive means, the adhesive means on the movable section being substantially exposed for adhesion to the article without movement of the article by peeling off the peel-off section.

4,400,900

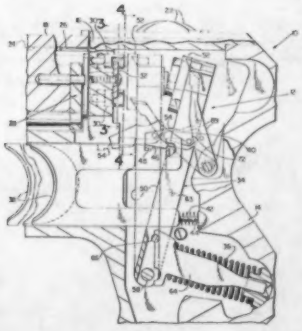
MULTI-BARREL HANDGUN FIRING MECHANISM

Robert L. Hillberg, P.O. Box 813, Cheshire, Conn. 06410, and Frederick F. Stevens, 177 Brett Rd., Fairfield, Conn. 06430

Filed Oct. 2, 1981, Ser. No. 308,383

Int. Cl.³ F41C *19/00*

U.S. Cl. 42—69 R **11 Claims**



8. In a handgun having a hammer assembly including a hammer having a forwardly facing striking face and a bore opening through the striking face, a firing element having a rearwardly facing surface engaging said striking face, a shaft

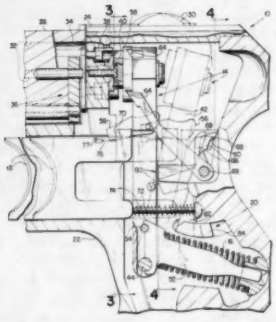
projecting rearwardly from said rearwardly facing surface and received within the bore and supporting the firing element for indexible rotation relative to the hammer, and means retaining the firing element in assembly with the hammer, the improvement wherein said retaining means comprises a radially outwardly opening annular groove in said shaft partially defined by a forwardly facing and rearwardly diverging frustoconical surface and a detent mechanism disposed within said hammer and including a detent member engaging said frustoconical surface in spaced relation to the inner surface of said groove and biasing means for urging said detent member toward said shaft.

4,400,901

FIREARM HAVING INERTIALLY RESPONSIVE SAFETY MECHANISM

Robert L. Hillberg, Cheshire, Conn., assignor to COP, Inc., Torrance, Calif.

Filed Aug. 5, 1981, Ser. No. 290,154
Int. Cl.³ F41C *17/00*
U.S. Cl. 42—70 F **14 Claims**



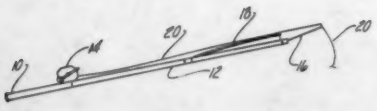
1. In a double action firearm having a firing mechanism including a trigger movable between ready and firing positions, a hammer movable between tripping and striking positions, and means for moving the hammer to and releasing it in its tripping position in response to movement of the trigger from its ready to its firing position, the improvement comprising an inertia responsive safety mechanism including a blocking element, means supporting said blocking element for movement between inactive and active positions, said blocking element in its active position being disposed in blocking relation to said hammer assembly to prevent movement of said hammer assembly from its striking to its tripping position, means normally biasing said blocking element to its inactive position, and means for moving said blocking element from its inactive to its active position in response to inertial force acting on the gun and tending to move said hammer toward its tripping position.

4,400,902

AUTOMATIC FISHING APPARATUS

Louis J. Adoline, 1988 Michigan St., Toledo, Ohio 43611

Filed May 26, 1981, Ser. No. 267,009
Int. Cl.³ A01K *91/06*
U.S. Cl. 43—15 **3 Claims**



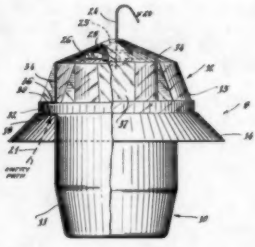
1. An automatic fishing device comprising: an elongated rod member, an elongated trigger member pivotally mounted on and projecting beyond one end of said elongated rod member and being movable between first and second positions, a line having one end anchored at the other end of said elongated rod member, a leaf spring member on said elongated rod member adjacent to said trigger member and deflectable outwardly from a tensioned position to an untensioned position, a notch formed in said trigger member and being engageable with said leaf spring to retain the latter in said tensioned position when said trigger is in said first position, guide means formed by guide holes at opposite ends of said trigger member, said holes receiving said line from said anchored end and guiding said line over said trigger member to move said trigger member from said first to said second position when said line is pulled, said guide means guiding said line to momentarily remain in contact with said spring member when said spring member moves from said tensioned position to said untensioned position.

4,400,903

METHOD AND APPARATUS FOR TRAPPING FLYING INSECTS EXHIBITING PHOTOTROPIC BEHAVIOR, PARTICULARLY GYPSY MOTHS

James W. Seidenberger, Royersford, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Apr. 17, 1981, Ser. No. 255,293
Int. Cl.³ A01M *1/02*
U.S. Cl. 43—122 **24 Claims**



1. A trap for catching flying insects exhibiting phototropic behavior, said trap comprising:

an enclosure having a plurality of openings therein facing upwardly for defining upwardly directed entry paths through the openings into the enclosure for said flying insects, and

at least a portion of said enclosure above said openings formed from light-transmissive material,

said enclosure includes a plurality of inwardly directed ridges which are positioned in substantial axial alignment with, and spaced apart from and above said openings for forming gaps between said ridges and said openings within said enclosure,

whereby said ridges provide obstructions tending to prevent the random escape through said openings of flying insects entrapped within said enclosure,

means are provided within the enclosure for holding an odor-releasing attractant within said enclosure above the level of said inwardly directed ridges,

the regions of said enclosure between said inwardly directed ridges serve as channels for conveying the odor from said attractant downwardly near to said openings,

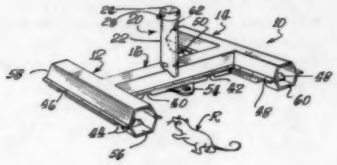
whereby flying insects entering said enclosure through said openings are attracted upwardly away from said openings by external light passing downward through said light-transmissive portion of said enclosure.

4,400,904

RODENT BAIT STATION

Rex O. Baker, 1776 Bobbitt Ave., Corona, Calif. 91720

Filed Jul. 27, 1981, Ser. No. 287,491
Int. Cl.³ A01M *25/00*
U.S. Cl. 43—131 **11 Claims**



1. A self-standing, tamper-resistant, H-shaped rodent bait station comprising:

a pair of parallel, open-ended members connected together at their centers by a transverse member to form an H configuration, the parallel members defining parallel passageways in communication with a transverse passageway defined by said transverse member:

the parallel members having partial restriction means at their open ends;

said transverse member having a pair of central restrictions extending upwardly from the inner bottom surface thereof to define a bait zone; and

said transverse member having a central loading means extending upwardly therefrom, the loading means having a removable top cap, said cap being securable after using said loading means to charge said bait zone in said transverse member with a toxicant bait, the bottom of said loading means entering a short distance into said transverse passageway forming a skirt,

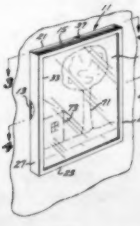
whereby ports, formed by the open ends of said parallel members, provide an entrance and egress means for a target animal which is able to surmount said partial restriction means therein, so that the target animal may find and feed on said toxicant bait, said loading means skirt and central restrictions preventing the animal from entering said bait zone except with its head so as to feed without fouling the bait, the H configuration and partial restriction means limiting access only to the target animal and preventing larger animals or children from getting at the bait therein.

4,400,905

DECORATIVE ROACH TRAP

Harold Brown, P.O. Box 2663, Washington, D.C. 20013

Filed Oct. 15, 1981, Ser. No. 311,780
Int. Cl.³ A01M *1/20*
U.S. Cl. 43—132.1 **10 Claims**



1. A decorative roach trap comprising:

a housing formed with a roach receiving compartment having side, front and back walls and terminating at one end in a slot;

a window in said front wall;

a poisonous insert received in said compartment;

at least one doorway in one wall of said housing for entry into said compartment of roaches;

a decorative panel facing outwardly for viewing through said window and arranged to be viewed by an observer when said housing is in an upright position;

panel retaining means for retaining said panel on said housing for viewing from said window; and,

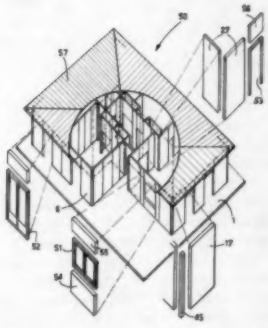
support means on said housing for supporting it in said upright position for viewing of said decorative panel and entry into said doorway of roaches.

4,400,906

HOUSE CONSTRUCTION SET

Fred Bove, Luxembourg, Luxembourg, assignor to Plaserco S.A., la Foire, Luxembourg

Filed Nov. 8, 1979, Ser. No. 92,580
Claims priority, application France, Nov. 17, 1978, 78 32546
Int. Cl.³ A63H *33/16*
U.S. Cl. 46—21 **21 Claims**



1. A construction set, particularly for constructing houses, comprising at least outer wall modules, inner partition modules, a rectangular floor, the floor comprising a mosaic jointing structure formed by identical mortises, or tenons, perpendicular to its surface, aligned in two perpendicular directions at regular, predetermined pitches and the transverse sections of which are parallel to its surface and inscribed in squares, each of said modules being formed by a rectangular panel of which at least one edge comprises a jointing structure identical to that of the floor, and adaptation elements comprising on two of their opposite parallel longitudinal faces a jointing structure complementary to that of the floor and of the modules, formed by tenons, or mortises, said squares of the sections of the mortises, or tenons, of the floor being distributed on the surface of the floor in two series of squares whose diagonals are respectively parallel to the edges of the floor and aligned at a pitch equal to double the length of these diagonals, the squares of one of the two series of squares being offset with respect to those of the other series by half said pitch in the two directions parallel to the edges of the floor.

4,400,907

MOUNTING HARNESS FOR AN AMUSEMENT BALL DEVICE

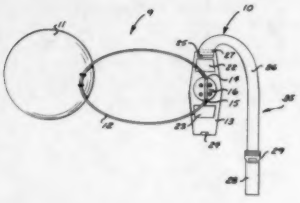
Bernard Alter, 923 N. Pass Ave., Burbank, Calif. 91505, and Fred Rhyme, 126 E. Spruce St., Compton, Calif. 90220

Filed Oct. 19, 1981, Ser. No. 312,734
Int. Cl.³ A63H *3/50*
U.S. Cl. 46—32 **3 Claims**

1. An improved mounting harness combination for an amusement and exercise ball device, comprising:

a single wide strap having a first strap terminus and a second strap terminus,

a mounting plate having a first plate terminus, a second plate terminus, and a centrally located selected diameter circular aperture, said first plate terminus having a narrow slot disposed adjacent said first plate terminus and said first strap terminus permanently secured around said first plate terminus, said second plate terminus having an integral hook formed thereon from said terminus plate, said centrally located aperture having a shallow holding chamber and having a collar secured respectively on each side of said aperture, said chamber rotatably locked in said aperture by a split washer secured between said mounting plate and said collar, said holding chamber having a chamber top secured on said chamber by fasteners, said chamber top and said holding chamber providing a slotted holding means for a hoop to which a ball is rotatably secured, and, an adjustable buckle disposed and secured on and adjacent to said second strap terminus, said buckle having a first terminal narrow slot disposed therein of a width slidably accepting said strap, said buckle having a second parallel mid-width strap slot having projections extending into said slot securing said strap and preventing its slippage, and a second terminal slot adapted and sized to secure said integral hook formed and disposed in said second plate terminus, said mounting harness providing finger tip rotation of said hoop, locked into said shallow holding chamber, to any angular disposition on said plate.



4,400,908

MINIATURE VEHICLE ACTION TOY

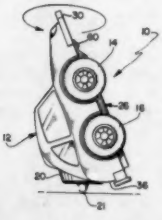
Yoshiro Nomura, 17-5, 2- Chome, Kuramae, taito-ku, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 363,437

Claims priority, application Japan, Oct. 2, 1981, 56-145962[U]

Int. Cl.³ A63H *29/20*

U.S. Cl. 46—209 **6 Claims**



1. A miniature vehicle action toy comprising:

a. a miniaturized vehicle body;

b. a plurality of wheels rotatably mounted on said body and supporting same for movement on a supporting surface, at least one of said wheels comprising a drive wheel;

c. a drive shaft rotatably mounted on said vehicle, one end of said shaft being disposed within said body, the other end of said shaft being disposed external of said body;

d. an inertial flywheel mounted on said drive shaft;

e. an external rotatable action element mounted on said shaft external of said body, said action element having a center balancing pin; and

f. means drivingly connecting said shaft to said drive wheel for rotation therewith, whereby when said vehicle is manually advanced on a supporting surface so as to effect rotation of said drive wheel, rotation of said drive shaft, said flywheel and said external action element is also effected.

4,400,909

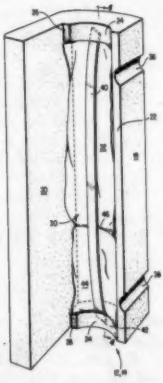
PLANT PROTECTOR WITH HEAT SINK AND PESTICIDE PACKET

Stanton L. Reese, 726 Laurel La., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 90,079, Oct. 31, 1979, Pat. No. 4,341,039, which is a continuation-in-part of Ser. No. 971,184, Dec. 20, 1978, abandoned. This application Feb. 3, 1981, Ser. No. 231,364

Int. Cl.³ A01G *13/00*; A01M *1/18*

U.S. Cl. 47—2 **9 Claims**



1. A self-expanding insulator for thermally insulating and protecting the trunk of a plant from pests which comprises:

(a) two semi-rigid elements made of lighweight insulating materials which, when assembled, define a self-expanding cavity substantially in the center of the assembled elements;

(b) means in cooperation with said elements for allowing automatic self-expansion of the cavity in accordance with changes in the girth of the trunk;

(c) a packet containing a pesticide associated with the elements in position in close proximity to a substantial portion of the plant trunk, said packet protecting the pesticide from loss or destruction by water and permitting pesticide vapors to escape at a rate sufficient to repel pests from the closed area of the trunk of the plant to be protected; and

(d) heat sink means associated with the elements in position in close proximity to a substantial portion of the plant trunk.

4,400,910

METHOD FOR PROTECTING PLANTS DURING TRANSPORTATION BY PACKAGING AND ARTICLE

Willem Koudstaal, Vinkeveen, Netherlands, and William J. Organ, Petersfield, England, assignors to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Apr. 22, 1981, Ser. No. 256,397
Claims priority, application Netherlands, Apr. 25, 1980, 8002435
Int. Cl.³ A01G 9/02, 5/06
U.S. Cl. 47—84 3 Claims

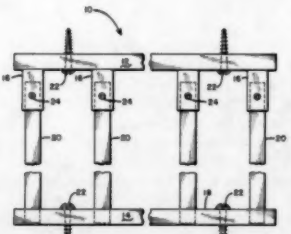
1. A method for protecting potted plants during transport which comprises the steps of (a) enclosing the potted plant including soil with moisture and nutrients for said plant in a flexible and sealable package comprising a microporous film portion and a second portion of a transparent substantially impervious plastic film, the microporous film having an air-permeability of 0.1 to 300 mm^3 air per second per Pascal per m^2 of the film with pore diameters smaller than 0.5 μm, and the package being self-inflating within a short time after sealing due to evaporation of the moisture supplied by the potted plant, (b) sealing the package, and (c) permitting the package to self-inflate.

4,400,911

ADJUSTING WINDOW SECURITY GRILL

Dwain C. Bell, and Aurel L. Bell, both of Minneapolis, Minn., assignors to Bell Manufacturing & Services, Inc., Minneapolis, Minn.

Filed Oct. 6, 1980, Ser. No. 194,685
Int. Cl.³ E06B 3/68
U.S. Cl. 49—55 6 Claims



1. a security grill for preventing unauthorized entry into a building, comprising:

(a) a pair of elongated members adapted to be attached to opposite sides of a building's window opening, one of said pair of elongated members having a plurality of apertures formed therein at predetermined spacings;

(b) a corresponding plurality of tubular studs of a predetermined length affixed to and extending perpendicularly from the other of said pair of elongated members, the lateral spacing between adjacent stubs corresponding to said predetermined spacings; and

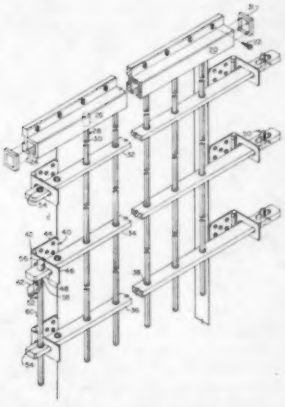
(c) a corresponding plurality of bar members having first ends insertable into said apertures and second ends telescopingly received in said tubular stubs.

4,400,912

PATIO DOOR AND WINDOW GUARD SYSTEM

Jerome L. Wicks, Sr., 3401 Rockdale Ct., Baltimore, Md. 21207

Filed Dec. 15, 1981, Ser. No. 330,947
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ E06B 3/68
U.S. Cl. 49—57 3 Claims



1. In an interior-type system for barring intruder-access through an opening such as a patio door opening, and including an overhead track with a slot, a plurality of headed rods depending from said track through said slot, means for locking said plurality of headed rods including detachable horizontal bar means for sliding up said plurality of headed rods and holding the plurality of headed rods in spaced array across said opening by means of a plurality of rod-receiving perforations in said detachable horizontal bar means, and a bracket supporting each horizontal bar end with a padlock on a said bar end for engaging a said bracket, the improvement comprising: said means for locking including a plurality of said detachable horizontal bar means, and a vertical pin having means for detachably locking together said plurality of detachable horizontal bar means.

4,400,913

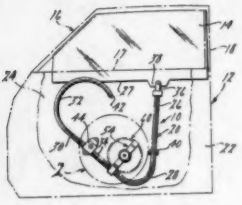
COUNTERBALANCE PINION FOR VEHICLE WINDOW REGULATOR

Emerson H. Krantz, Roseville, and Russell H. Peebles, Grosse Pointe Park, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 15, 1981, Ser. No. 274,041
Int. Cl.³ E05F 11/48
U.S. Cl. 49—352 2 Claims

1. In a window regulator mechanism for a vehicle window-pane having an elongated track, an elongated flexible plastic rack provided with means for engaging said track supporting said rack for sliding motion longitudinally of said track, rack teeth integrally formed on the other side of said rack, said rack

having means thereon for attachment to the windowpane, said track having a portion shaped to conform to the path of movement of the bottom edge of the windowpane and an extension curved to extend away from said path, drive gear means meshing with said rack teeth, and means connecting said drive gear means to a manual operator for rotating said drive gear means about a first shaft to effect linear translation of said rack and concurrent movement of said windowpane the improvement wherein a counterbalance pinion meshing with said rack teeth and operative to be rotated about a second fixed shaft in one rotary direction by travel of said rack during upward closing movement of said windowpane and in the other rotary direction by said rack during downward opening movement of said windowpane, an elongated spiral convolute spring having inner and outer end portions and an intermediate portion connecting said inner and outer end portions and extending about the axis of said second shaft, said inner end portion received in a diametrical slot of said second shaft, said outer end portion terminating in a hook adapted to engage releasable hook capturing means formed on the interior of the counterbalance pinion rim, rotation of said drive gear means by the manual operator in said one direction effecting translation of said rack on said track in a first direction and concurrent rotary movement of said counterbalance pinion in said one rotary direction



such that the spring is operative for storing a portion of the potential energy of the windowpane when the pane is lowered tending to at least partially counterbalance the weight of the windowpane as it is moved upwardly by the translation of said rack in a second direction by the drive gear means by virtue of the stored energy action of the spring tending to rotate said counterbalance pinion in the other rotary direction thereby assisting in the raising of the windowpane; said counterbalance pinion including external gear teeth thereon meshing with said rack teeth, said external gear tooth having a blank no-tooth rack blocking segment thereon which blocks the movement of said rack after a predetermined length of travel on the track thereby preventing the separation of said rack from said track obviating said spring being inadvertently released when the mechanism is a subassembly prior to its being installed in the vehicle; said counterbalance pinion of a predetermined diameter such that said segment is located at a first angular location out of blocking contact with said rack teeth with said windowpane being fully raised, and wherein said pinion is rotated through an arcuate path by said rack in said other rotary direction through a predetermined angle such that said segment is rotated to a second angular location without said segment being moved into its rack blocking position upon said windowpane being fully lowered.

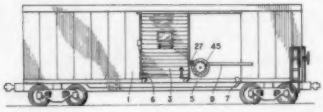
4,400,914

SLIDING DOOR OPERATING MEANS

James J. Hennessy, Chambersburg, Pa., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Filed Jul. 29, 1981, Ser. No. 287,762
Int. Cl.³ E05F *11/54*
U.S. Cl. 49—362 **5 Claims**

1. The combination of a side wall having a door opening, a door movable along said wall between positions closing and exposing said opening, an elongated rack extending lengthwise of said wall and secured thereto, operating mechanism connected to said door and having a pinion meshing with the rack, manually actuated means for rotating said pinion to move the door between open and closed positions, and an energy absorbing coupling between said manually actuated means and said pinion for absorbing rotational energy resulting from the inertia of the manually actuated means when the door reaches the end of its travel either to the opened or completely closed positions, said operating mechanism having a drive shaft drivingly connected to said pinion and having a common rotational axis with said manually actuated means, said energy absorbing coupling comprising an elastomeric sleeve antirotatably con-



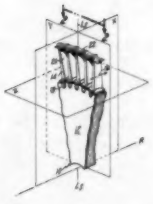
nected at one end to said manually actuated means and at the other end to said drive shaft, said drive shaft having an axially projecting portion extending through said coupling and through a central hole in said manually actuated means and a fastening device detachably secured to said projecting portion externally of said manually actuated means in abutting relation to the outer surface of said manually actuated means to hold said manually actuated means, said coupling and said drive shaft in assembled relation with each other while accommodating such rotation of said manually actuated means relative to said drive shaft as is permitted by yieldability of said elastomeric sleeve in torsional shear.

4,400,915

FIXTURE FOR RESTORING A FACE ON THE SHROUD OF A ROTOR BLADE

John P. Arrigoni, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1980, Ser. No. 155,252
Int. Cl.³ B24B *41/06*; B21K *3/04*
U.S. Cl. 51—217 R **4 Claims**



1. A fixture for positioning a shroud of a worn rotor blade with resepct to a means for removing material during the removal of such material to form a face on the tangential side of a shroud, the rotor blade being adapted for use in an axial flow rotary machine and including a root, a center plane passing through the root, a groove in the root bounded by a wall and including an airfoil, the airfoil being defined by a plurality of airfoil sections positioned from a stacking line formed by the intersection of a plane extending in the axial direction and a plane extending in the tangential direction, which comprises:

a base;

an axial locator engaging the base which is adapted to engage the root of the rotor blade and to prevent movement of the root in the axial direction;

a tangential locator engaging said base formed of

a first locator means for rotatably engaging the root of the rotor blade to form a hinge joint parallel to the blade

root center plane and parallel to the wall on the root, and

a second locator means for engaging the airfoil of the rotor blade; and,

means for rotatably urging the said rotor blade about said hinge joint to urge said rotor blade into engagement with said second locator means;

wherein the tangential locator defines a tangential reference plane for measuring the tangential location of the shroud face and is adpated to adjust for the tangential dislocation of a worn airfoil by engaging a point on the airfoil and wherein the axial locator and said first locator define a reference plane for measuring the axial location of the shroud surface with respect to the root of the airfoil which is parallel to the stacking line of the rotor blade.

4,400,916

INDEXING GENERATING METHOD FOR GRINDING GEARS

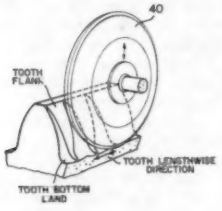
Peter Bloch, Mutschellen, and Hansjörg Bickel, Au, both of Switzerland, assignors to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland

Division of Ser. No. 157,977, Jun. 9, 1980. This application Sep. 23, 1981, Ser. No. 305,034

Claims priority, application Switzerland, Jun. 20, 1979, 5757/79

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—287 **2 Claims**



1. In an indexing generating method for grinding gear teeth having a substantially involute-shaped tooth flank profile, wherein generating movements are carried out between a substantially dished grinding wheel which undergoes wear and the gear tooth which is being round as well as feed movements in the tooth lengthwise direction, adjustment movements for compensation of the grinding wheel wear and indexing movements, the improvement which comprises the steps of:

grinding only a portion of a tooth flank of the gear on an indexing generating machine without grinding a related tooth bottom land thereof during the generating movements;

feeding the grinding wheel, independently of the magnitude of the adjustment movement needed for compensation of the wear of the dished grinding wheel, between each two respective indexing movements towards the related bottom land of the gear tooth by an amount sufficient to also subsequently grind such related tooth bottom land;

grinding said related tooth bottom land by a peripheral portion of the dished grinding wheel on the same indexing generating machine;

grinding the related tooth bottom land along a grinding curve which differs from an involute curve along which there is ground said involute-shaped tooth flank profile of the gear teeth; and

grinding the remaining involute-shaped tooth flank profile by a different portion of the grinding wheel which is arranged inwardly of said peripheral portion used for grinding the tooth bottom land.

4,400,917

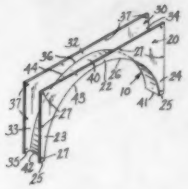
ARCH PREFORM AND METHOD OF CONSTRUCTING ARCH PASSAGEWAY

Bruno Massaro, 1534 Dunbar Hill Rd., and Vincent Massaro, 375 Wintergreen Ave., both of Hamden, Conn. 06514

Filed Jan. 23, 1981, Ser. No. 228,157

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—86 **7 Claims**



1. An arch preform for facilitating the construction of an arch passageway from a passageway defined by a substantially rectangular frame, having a top, two sides, a front face and a rear face, said preform comprising:

a front panel portion and a rear panel portion, each of said panel portions being defined by a top edge, two side edges, and a bottom edge partially constituted by a substantially arcuate boundary, said panel portions being substantially flat and parallel;

a substantially arcuate panel portion extending between said front and rear panel portions adjacent said arcuate boundaries and integral therewith;

each of said three panel portions being comprised of a sheet of material of substantially uniform thickness, said thickness being small relative to the distance between said front and rear panel portions, and

said panel portions being dimensioned so that said preform may be positioned at the top of the passageway defined by said frame whereby said front and rear portions engage against the corresponding front and rear faces of the frame and said arcuate panel portion extends between the sides of the frame and passes closely adjacent to the top of the frame.

4,400,918

FOAM/FOIL BACKER FOR SIDING AND SIDING ASSEMBLY AND METHOD FOR MAKING SAME

Eugene R. Lewis, 9 Candee Rd., Prospect, Conn. 06712

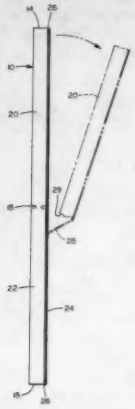
Filed Nov. 30, 1981, Ser. No. 326,155

Int. Cl.³ E04C *1/34*

U.S. Cl. 52—98 **9 Claims**

1. A dual-purpose backerboard member comprising: an elongated insulating backerboard of cellular synthetic resin, said backerboard having a weakening line extending along the length, and substantially at the center of the height, thereof; and a coextensive barrier sheeting bonded to one face thereof, said barrier sheeting and backerboard being substantially free from bonding along a zone extending along and directly adjacent said weakening line, the width of said zone being greater than the thickness of said backerboard, so that said backerboard can be separated at said weakening line into two sec-

tions, and said barrier sheeting can readily be displaced from said backerboard along said zone so as to permit the adjacent



edge portions of the separated sections to be overlapped without damage to or discontinuity in said barrier sheeting.

4,400,919

MOBILE HOME SKIRTING SYSTEM

Robert J. Szabo, and Garfield W. Stovin, both of Kansas City, Mo., assignors to Variform Plastics, Inc., Kearney, Mo.

Filed Apr. 17, 1981, Ser. No. 255,302
Int. Cl.³ E04C *1/30;* E04B *2/82;* B60R *27/00*
U.S. Cl. 52—169.12 **11 Claims**

1. In an elevated building having a space therebeneath, a skirt for said space comprising:

a plurality of upright ground-supported panels disposed in edge to edge relationship;

interlock structure on the adjacent edges of the panels, said structure including mating extensions for releasably interconnecting said adjacent panel edges, said extensions cooperating to present an upright passage therebetween; and

upright stays received within certain of said passages for guiding the skirt for up and down movement thereof relative to the building during changes in the contour of said ground and resisting lateral movement of the skirt,

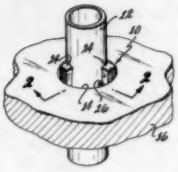
said skirt being adjacent the building when placed in surrounding relationship thereto, each stay extending above the skirt and having means at the upper end thereof for coupling the same with the building.

4,400,920

APPARATUS FOR SECURING PIPE

Duane D. Logsdon, P.O. Box 186, Stanton, Calif. 90680

Filed Apr. 16, 1981, Ser. No. 254,924
Int. Cl.³ E04B *5/48*
U.S. Cl. 52—221 **11 Claims**



1. An apparatus for securing a pipe to a structural wall, floor or ceiling element wherein said pipe penetrates through said element by passing through a hole in said element which comprises:

a first member and a second member;

each of said members including a base having a first end and a second end;

each of said members having at least one rib attaching essentially perpendicular to said base of said member and extending between the ends of said base, said ribs on each of said members tapering from said first end to said second end of the base to which it is attached such that in side view each of said members is wedge shaped;

said first and said second members locatable in said hole next to said pipe such that said first end of said first member is oriented toward said second end of said second member and said second end of said first member is oriented toward said first end of said second member positioning said second end of each of said members against the rib of the other of said members and a portion of each of said ribs of said first and said second members interdigitized so as when said first ends of each of said members are brought closer together said bases of said first and said second member are extended away from each other one impinging against said pipe and the other impinging against the walls of said hole.

4,400,921

BUILDING STRUCTURE AND THE METHOD OF ERECTING BUILDINGS FROM RIBBED AND CHANNELLED SHEETS

Benjamin Frenkel, 27 Sheshet Hayamim St., Herzlia, Israel

Filed Aug. 18, 1980, Ser. No. 178,906
Claims priority, application Israel, Sep. 10, 1979, 58216
Int. Cl.³ E04C *1/38*
U.S. Cl. 52—284 **3 Claims**

1. A building comprising:

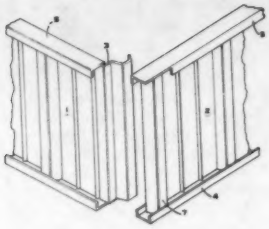
a plurality of wall elements, each wall element including at least one sheet having defined thereon a plurality of vertically extending channel shaped ribs extending from a top edge of the sheet to a bottom edge thereof and top and bottom channel members engaging said top and bottom edges to define a generally planar main wall portion;

said at least one sheet being bent along a vertical line intermediate said vertically extending channel ribs to define a joining portion including a vertically extending channel shaped rib, said joining portion extending beyond said top and bottom channel members and being angled with respect to said main wall portion;

said plurality of wall elements being joined to each other to define an enclosure wherein the joining portion of each

wall element is arranged in overlapping parallel engagement with a portion of said at least one sheet forming part of the main wall portion of an adjacent wall element,

and wherein at least one of said top and bottom channel members is provided with a cut out portion adjacent a side



edge thereof for accommodating the joining portion of an adjacent wall element,

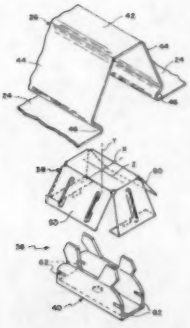
whereby the vertically extending channel shaped rib of said joining portion lies in coplanar parallel registration with a vertically extending channel shaped rib of the main wall portion of an adjacent wall element.

4,400,922

PANEL MOUNTING CLIP ASSEMBLY AND WALL OR ROOF STRUCTURE UTILIZING THE SAME

Keith D. Boyer, Connersville, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Mar. 30, 1981, Ser. No. 249,062
Int. Cl.³ E04B 1/62
U.S. Cl. 52—394 **27 Claims**



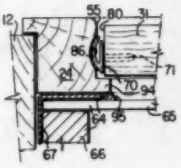
17. In a roof or wall structure having horizontally extending panel support members, the combination of a plurality of panel members extending transverse of said panel support members and being erected in side-by-side edge interlocked relation, each of said panel members comprising alternating panel webs and upstanding longitudinal ribs, each of said ribs comprising a crest, depending rib sidewalls, and spaced-apart inturned base portions connecting said rib sidewalls to adjacent ones of said panel webs; and panel mounting clip assemblies, one connecting each of said ribs to said panel support member, each of said assemblies including a top clip disposed within the rib and including clamping wings extending generally parallel with the rib and having clamping edges engaging said inturned base portions, and connecting wings extending transversely of the rib and terminating in terminal flanges below the level of said clamping edges and angled relative to said connecting wings; a base member secured to said support member and including spaced-apart generally parallel, opposite faces extending transversely of said clamping wings; guide means associated with said opposite faces receiving said terminal flanges thereby connecting said top clip to said base member in moveable relationship to provide for movement of said top clip transversely of said base member into registry with the rib; and stop means limiting movement of said top clip relative to said base member.

4,400,923

CATCH MEMBER

Jean P. Giguere, St-Agapit, Canada, assignor to Donat Flamand Inc., Lobiniere, Canada

Continuation of Ser. No. 93,367, Nov. 13, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,694
Claims priority, application Canada, Jul. 18, 1979, 332045
Int. Cl.³ E06B 7/70
U.S. Cl. 52—455 **15 Claims**



1. A one-piece molded catch member made of rigid plastic material, comprising a cylindrical stem and a head portion disposed across said stem in a T-shaped configuration, said head portion consisting of a broad flat base whose lower surface connects with the adjacent end of said stem at a right angle relative to the longitudinal axis of said stem, and an arcuate arm overlying the upper surface of said base in a flattened C-shaped configuration, said arcuate arm having its outer surface smooth, and being relatively thin so as to be flexible in the direction normal to said base, said lower surface of said base being flat and defining a bearing surface around said stem, said base having a generally straight edge along which said arcuate arm connects to said base, the portion of said arcuate arm which overlies said base being spaced apart from the upper surface of said base and being resiliently movable toward said upper surface of said base, the upper surface of said arcuate arm being flat in a first direction parallel to said straight edge and curved in the transverse direction, said stem being essentially solid and rigid and being of constant circular cross-section over substantially all of its length from said base, said stem including at least three and not substantial more than four longitudinal rectilinear ribs of similar cross-section which are parallel to the axis of the stem and which are equidistantly distributed around the periphery of said stem, said ribs being relatively sharp and extending radially outwardly to said stem over a radial distance which is considerably less than the radius of said stem to permit said stem to be inserted into a mounting hole of a diameter equal to the diameter of said cylindrical stem without appreciably stressing the material in which the hole is located and to be retained in the hole without rotating.

4,400,924

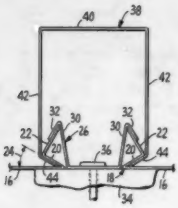
METAL ROOFING SYSTEM

Charles F. Andrews, 80 Loree La., Millbrae, Calif. 94030

Filed Oct. 21, 1980, Ser. No. 199,326
Int. Cl.³ E04C 1/34
U.S. Cl. 52—466 **3 Claims**

1. A roofing joint construction comprising a support member, a clip member attached to said support member, and a pair of strip members attached to said clip member, said clip member comprising a base portion attached to said support member, side walls extending upwardly from said base portion, and

lips extending outwardly and downwardly from said side walls at an acute angle with respect thereto, said strip members comprising base portions disposed on said support member, side flanges on said strip member base portions consisting of upwardly and inwardly extending root portions and upwardly and outwardly extending tip portions, said tip portions being disposed in parallel and contactual relation with the underside



surfaces of said lips of said clip member, said side flanges of said strip members and said clips being so dimensioned as to make each strip member engageable with an attached clip by tipping said strip member first in one direction, inserting said tip portion of said side flanges in contactual relation with the underside of an attached clip, and then tipping said strip member in the opposite direction.

4,400,925

BUILDING CONSTRUCTIONS

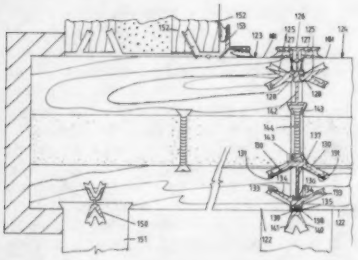
Johannes J. Van Loghem, and Johannes La Grouw, both of Russell Rd., Rotorua, New Zealand

Continuation of Ser. No. 85,210, Oct. 16, 1979, abandoned, which is a continuation of Ser. No. 927,333, Jul. 24, 1978, abandoned. This application Oct. 28, 1981, Ser. No. 316,069

Claims priority, application New Zealand, May 23, 1978, 187344

Int. Cl.[3] **E04B** *2/30;* **E04D** *1/36*

U.S. Cl. 52—471 **3 Claims**



1. A wall construction comprising a plurality in planks joined at their ends to other members of the wall construction, each plank having a wooden facing member on each side and insulation between said facing members, each wooden facing member having adjacent the joined end thereof at least one jointing surface which is cut out substantially flat and extends in a plane intersecting at an acute angle with the end surface of said plank to be joined to another member of said wall construction, said planes of said jointing surfaces extending at an angle with respect to each other, a plurality of metal connecting members each comprising a shank portion having connecting arms extending in substantially opposite directions with respect to said shank portion and at an angle with respect to each other substantially the same as said angle of said planes of the jointing surfaces with respect to each other, said connecting members being inserted between said members to be joined and said connecting arms having surfaces extending in contiguous abutting relationship with said jointing surfaces of said facing members to retain said members together, and non-metallic tension resistant members made of heat insulating material interconnecting said shank portions of adjacent connecting members in opposite facing members of said joined planks, the interconnection between said connecting members and said tension resistant members comprising bulbous ends on said tension resistant members engaging within substantially C-shaped terminations on said shank portions.

4,400,926

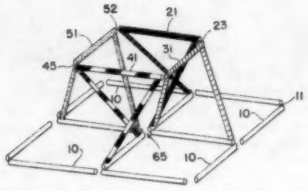
INTEGRATED DIMORPHIC STRUCTURE

Gordon P. Tuggle, P.O. Box 6522, Portsmouth, Va. 23703

Filed Aug. 21, 1981, Ser. No. 294,972

Int. Cl.[3] **E04H** *12/18*

U.S. Cl. 52—646 **18 Claims**



1. An integrated dimorphic structure comprising:

base members connected to form a plurality of base squares attached together to form the base of a truss;

a plurality of quadrilateral members, each having a top member, two side members and one side in common with said base members and being fixedly attached to said base members;

connecting means for connecting said top members after said quadrilaterals are raised upright and each of said top members has been rotated in a common direction and approximately 90° relative to said one side of said quadrilateral containing said top member, whereby said top members are joined to form top squares and said side members form the edges of pyramids resting on said base squares.

4,400,927

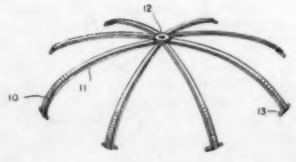
METHOD OF FORMING A SKELETAL DOME STRUCTURE IN SITU

Amde M. Wolde-Tinsae, Ames, Iowa, assignor to Iowa State Research Foundation, Inc., Ames, Iowa

Filed Jul. 14, 1980, Ser. No. 167,808

Int. Cl.[3] **E04B** *1/00*

U.S. Cl. 52—745 **4 Claims**



1. A method for forming a skeletal dome structure in situ, comprising the steps of arranging a plurality of substantially straight, elongated, and flexible lower strips of high compressive and tensile strength about a central hub with said lower strips disposed generally horizontally and radiating outwardly from said hub; each of said lower strips having an inner end

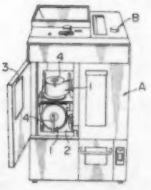
located adjacent said hub and an outer end remote from said hub; securing a straight and horizontally-elongated flexible core to an upper surface of each of said lower strips, each lower strip and core being disposed in parallel relationship with the underside of said core being affixed along its length to the upper surface of the associated lower strip; connecting the inner end of each of said lower strips to said hub; then shifting said hub upwardly while simultaneously advancing the outer ends of all of said lower strips and cores radially inwardly to cause flexure of each of said lower strips and cores to produce a longitudinal convex curvature along the top of each core; then anchoring the outer end of each lower strip in place; and thereafter securing a flexible upper strip of high compressive and tensile strength along the convex top surface of each core.

4,400,928

PACKING PAPER SUPPLY APPARATUS FOR COIN PACKING MACHINE

Kenkichi Watanabe, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 37,862, May 10, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,095
Claims priority, application Japan, May 11, 1978, 53-55963
Int. Cl.³ B65B *41/12, 57/00*
U.S. Cl. 53—64 **7 Claims**



1. A packaging paper supply apparatus for use with a coin packaging machine having a body, comprising:

a carriage accomodated in the body of said coin packaging machine;

a plurality of holders supported by said carriage, said holders being charged with kinds of packaging paper corresponding to kinds of coins to be packaged;

a plurality of stoppers corresponding to the number of holders carried on said carriage;

drive means for driving said carriage to rotate;

a power supply connectable to said drive means;

an engaging member resiliently biased into abutment contact with one of said stoppers and adapted to be brought into and out of engagement with the one of said stoppers in accordance with the rotation of said carriage, said engaging member being disengaged from an engaged stopper upon rotation of said carriage by said drive means and upon manual rotation of said carriage;

a door provided on the body of said coin packaging machine, the door being opened to provide access to said carriage;

switch means for disconnecting said drive means from said power supply when said door is opened, so that said carriage is manually rotatable to move a selected holder from a position supplying packaging paper to a position receiving packaging paper, and for connecting said drive means to said power supply when said door is closed so that said carriage is rotated to return the selected holder to the supplying position; and

control means for controlling connection of said power supply to said drive means so that said power supply, when disconnected from said drive means, abruptly stops said drive means to hold a selected one of said holders in the supplying position thereof, said control means comprising:

coin kind setting means for positioning one of said holders in the supplying position thereof, said setting means having a set switch associated with the supplying position of each of said holders;

a plurality of switches fixed with respect to said body, each of said plurality of switches being coactive with a respective one of said set switches to connect said power supply to said drive means;

a contact member associated with each of said holders, said contact members being rotatable with said carriage;

switch means fixed with respect to said body and coactive with said contact members and said plurality of switches for disconnecting said power supply from said drive means; and

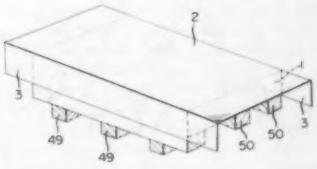
rectifier circuit means responsive to the disconnecting of said power supply from said drive means for supplying power to abruptly stop said drive means.

4,400,929

APPARATUS FOR FORMING BOX-SHAPED COVERING BODY

Takashi Iwaki, and Takeji Tanaka, both of Kisarazu, Japan, assignors to Yuwa Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,772
Claims priority, application Japan, Mar. 3, 1980, 55-25191
Int. Cl.³ B65B *11/00*
U.S. Cl. 53—580 **1 Claim**



1. A folding apparatus for forming a box-shaped cover body by bending a flat metal sheet to a snug fit over a rectangular shaped article beind covered, said apparatus having a longitudinal axis comprising in combination:

I. left and right support frames on opposing sides of said longitudinal axis with each of said support frames comprising:

(a) slidably adjustable intermediate-portion-holding member (**11, 12**), with a top and bottom surface, said bottom surface acting to hold the intermediate portion of the top portion of an article being covered, said intermediate-portion-holding member (**11, 12**) having longitudinally front and rear portions;

(b) slidably adjustable longitudinally front and rear end-portion holding members (**13, 14**) with longitudinally slidable members (**17, 18**) attached thereto, said front and rear end-portion holding members serving to hold the end portions of said article and being disposed at the front and rear of said intermediate-portion-holding member (**11, 12**) in the same plane therewith;

(c) first front and rear guide members (**15, 16**) having longitudinally extending flanges and a groove-shaped cross-section attached to the front and rear portions of the intermediate-portion-holding member (**11, 12**), said front and rear guide members (**15, 16**) receiving said longitudinally slidable members (**17, 18**);

(d) lateral intermediate-portion bending member (**19**) for bending down the corresponding portions of the sheet of metal used to cover the article and pivotally mounted to said intermediate-portion-holding member (**11,12**), front and rear lateral end portion bending members (**21**) for bending down the lateral end portions of said sheet of metal and pivotally mounted to the front and rear end-portion holding members (**13,14**);

(e) second front and rear guide members (**23**) with longitu-

dinally extending flanges and groove-shaped cross sections attached to the front and rear end portions of the intermediate-portion bending member (19), front and rear longitudinal movable members (24) attached to the end-portion bending members (21) and slidably fitted in the front and rear guide members (23), first drive means (27) with output shafts, longitudinally extending length-adjusting screw rod means (25, 26) attached to the longitudinally movable members (24) and connected to said output shafts of the first drive means (27);

(f) lateral-portion support member (33) with a lower and an upper portion, attached at said lower portion to the midpoint of said top surfaces of the intermediate-portion holding member (11, 12), pivotally supported fluid pressure lateral cylinder unit (34) including piston rod secured to said upper portions of said lateral-portion support member (33), said piston rod being pivotally secured to the midpoint of said intermediate portion bending member (21) moving said lateral intermediate and end portion bending members to assume folded positions;

(g) front and rear corner-portion folding members (4) including a substantially triangular plate member pivotally movably secured to the end-portion holding members (13, 14), fluid-pressure cylinder units mounted on the lateral end-portion bending members (21) with piston rods (46) attached to the corner folding members (4) so that when they are expanded or contracted, the corner folding members are pivotally moved to assume a folded or an upright position; and,

(h) front and rear end-portion bending members (6) with a lower part, pivotally secured to opposite end-surface holding members (12, 14), fluid pressure end-portion cylinder units (40) including piston rods attached to the end-portion bending members (6) so that when the fluid pressure end-portion cylinder units (40) are operated to expand or contracted positions, the end-portion bending members (6) are pivotally moved to assume a folded position;

II. front and rear width adjusting means with each said front and rear adjusting means comprising: transversely extending third guide members (28) with transversally extending flanges and groove-shaped cross-sections, left and right transversely movable members (29, 30) attached to the first left and right guide members (15, 16) and slidably disposed into the left and right sides of said transversely extending third guide members (28), transversely extending width adjusting screw rods (57) with second drive means (58, 60) connected to said transversely movable members (29, 30) to adjust the width thereof;

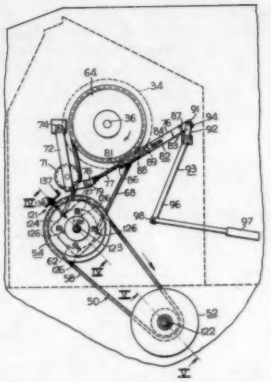
whereby, an article is covered by placing a flat metal cover sheet on the top surface thereof, the intermediate portion of the cover sheet being pressed on the article by the intermediate-portion-holding members (11, 12), the left and right lateral-portion bending members (19, 21) being pivotally moved so that the left and right side portions of the flat metal cover sheet are bent down to form left and right lateral cover portions along the left and right wall faces of the article, the, pivotally moving corner folding members (4) from the outer sides of said left and right lateral cover portions of said cover sheet toward the front and rear end faces of said article there by folding corners of said left and right lateral cover portions traversely inward of the article, parallel to the front and rear end faces thereof, forming triangular corner folds at the corners, pivotally moving end-portion bending members (6) downward, thereby folding down the front and rear end portions of said cover sheet to form front and rear end-face cover portions in conformity with the contours of the front and rear end faces of said article as well as said front and rear triangular corner folds.

4,400,930

HARVESTER THRESHING ROTOR DRIVE HAVING VARIABLE SPEED BELT DRIVE AND CLUTCHING MEANS

Michael L. Huhman, Kansas City, Mo., and Larry R. James, Olathe, Kans., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 10, 1982, Ser. No. 376,397
Int. Cl.[3] A01D *41/12*; A01F *12/56*
U.S. Cl. 56—11.6 4 Claims



1. In a combine harvester having a wheeled frame supporting an engine, an operator's station, a crop processor with a rotor for threshing crop material, a crop header and a conveyor means for moving crop material from the header to the threshing rotor, the combination comprising:

a threshing rotor shaft, and

a drive train connecting said engine in driving relation to said rotor shaft, including

a first belt pulley on one end of said rotor shaft,

a variable speed belt drive, including

first and second variable pitch sheaves, each with a pair of sheave halves, one of which is axially shiftable relative to the other to change the effective diameter of said sheaves between predetermined large and small diameter conditions, the shiftable sheave half of one of said sheaves being spring biased axially toward its large diameter condition,

an actuator operable to axially move the shiftable half of the other sheave between its small diameter condition and its large diameter condition, and

a V-belt operatively engaging said variable pitch sheaves, said one sheave changing from a large diameter condition to a small diameter condition when said actuator changes said other sheave from its small diameter condition to its large diameter condition, the speed ratio of said variable speed belt drive being changeable only when it is running,

a second belt pulley secured to one of sid sheaves to rotate concentrically therewith and said otherbsheave being driven by said engine,

a drive belt operatively engaging said first and second belt pulleys,

an idler clutch pulley engaging said drive belt and being shiftable between a first position, in which said drive belt is not tensioned, and a second position in which said belt is tensioned to provide driving torque to said rotor,

motion transmitting means connected to said clutch pulley for moving the latter between its first and second positions including a manually operable control at said operator's station for selectively operating said motion transmitting means, and

control means for said actuator including a manually

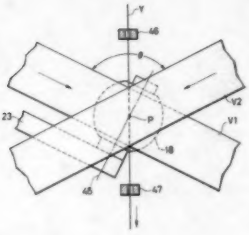
operable control at said operator's station for actuating said actuator, whereby said rotor may be disconnected from said variable speed belt drive to permit the latter to be driven by said engine and its speed ratio changed to effect a higher output torque.

4,400,931

BELT-TYPE FALSE TWISTING UNIT

Yoshiyasu Maeda, Yamato kouriyama, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 3, 1981, Ser. No. 317,922
Claims priority, application Japan, Nov. 7, 1980, 55-157242; Oct. 23, 1981, 56-169831
Int. Cl.³ D02G 1/04, 1/08
U.S. Cl. 57—336 7 Claims



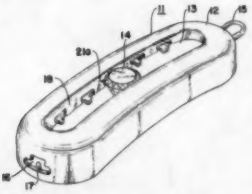
1. A belt-type false twisting unit comprising first and second belts running in directions opposite to each other and intersecting each other and a rotatable pressing roller falling in contact with the inner side of one of said first and second belts at the intersecting point, wherein by the pressing force of said pressing roller, said one belt is caused to fall in contact with the other belt in the state where said one belt is bent along the surface of the pressing roller and a yarn is nipped at the point of the contact between the two belts.

4,400,932

MODULAR JEWELRY LINK

Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.

Filed May 14, 1982, Ser. No. 378,323
Int. Cl.³ F16G 13/18
U.S. Cl. 59—82 7 Claims



1. A jewelry link for holding one or more precious stones or the like, comprising:

an elongated loop having a closed U-shaped ring protruding from one end thereof and a ring-receiving hole in the opposite end thereof;

said loop having an elongated internal hole extending between said ends, and

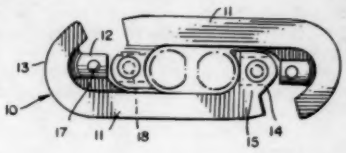
a deformable hook secured to said loop adjacent said ring-receiving hole and adapted to be deformed to engage the U-shaped ring of another similar loop when said other U-shaped ring is extended through said ring-receiving hole.

4,400,933

CONNECTING LINK

Dale A. Fillmore, Tualatin, and Terry L. Briscoe, Portland, both of Oreg., assignors to ESCO Corporation, Portland, Oreg.

Filed Mar. 16, 1981, Ser. No. 243,729
Int. Cl.³ F16G 15/00
U.S. Cl. 59—84 1 Claim



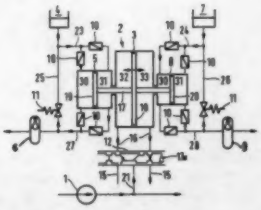
1. A connecting link comprising a pair of identical generally C-shaped elongated elements, each of said elements having an interior pin at a first end an interior pin-receiving aperture at a second end, the interior of said first end of each of said elements being contoured to mate with the exterior of said second end of the other of said elements whereby said link is assembled by first moving said elements transversely of each other to position said second end of each of said elements within said first and second ends of the other of said elements and thereafter moving said elements longitudinally of each other to engage said pins and apertures, each of said pins and apertures being equipped with integral means cooperating through elastic deformation when a pin is received in its associated aperture to resist inadvertent disassembly of said elements, said integral means including a detent on each pin, said pin receiving apertures being defined by spaced apart walls and recess means for said detent in at least one of said walls whereby said integral cooperating means are effectively hidden and not subject to stress.

4,400,934

GAS TURBINE UNIT WITH AUXILIARY DEVICES AND A COMPRESSED AIR BRANCH OR GAS UNDER PRESSURE

Georg Oberländer, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,430
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2936005
Int. Cl.³ F02C 7/32
U.S. Cl. 60—39.07 11 Claims



1. In a gas turbine engine which includes a compressor for compressing air for combustion in the engine and auxiliary devices having output functions necessary for the operation of the engine, which auxiliary devices are powered by compressed air bled from the engine, the improvement comprising:

an air line connected to the compressor for transmitting compressed air therefrom while the compressor is operating;

at least one source of operating fluid for use by the auxiliary devices;

a pressure transducer connected to the compressed air line, the pressure transducer including:

a pressure input side connected to the compressed air line and a pressure output side connected to the source of operating fluid for the auxiliary devices;

means for isolating the pressure input side from the pressure output side wherein the compressed air on the input side does not mix with the operating fluid on the pressure output side;

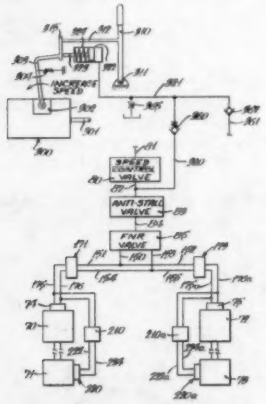
cyclically operated driving means on the input side for pressurizing the pressure output side; the cyclically operated driving means including a power piston reciprocally mounted in a cylinder, the power piston having opposed working surfaces on opposite sides thereof, means for connecting the compressed air line to the cylinder on opposite sides of the power piston, and means for alternately applying the compressed air to the opposed working surfaces of the power piston and for venting the air from the opposed working surfaces of the power piston, whereby the power piston reciprocates to pressurize the operating fluid at the pressure output side.

4,400,935

ENGINE SPEED CONTROL

Joseph E. Louis, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 28, 1980, Ser. No. 117,795
Int. Cl.³ F16H *39/46*
U.S. Cl. 60—431 **4 Claims**



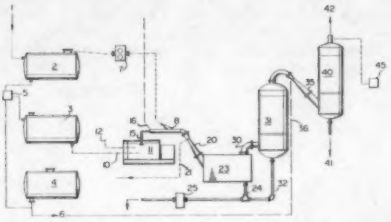
1. An engine speed control for an engine which powers a hydrostatic transmission usable in the drive of a vehicle, said hydrostatic transmission having a variable displacement pump with a control servo for setting pump displacement, a control circuit including said control servo, speed command means in said control circuit for establishing a speed control signal applied to said control servo to set pump displacement for a desired output speed of the vehicle, operator control means operable independently of the speed command means for setting the speed of the engine, and a control motor in the control circuit operatively connected to the operator control means and operable responsive to the speed control signal which sets pump displacement to increase the speed of the engine when the speed control signal exceeds a predetermined value.

4,400,936

METHOD OF PCB DISPOSAL AND APPARATUS THEREFOR

Gordon Evans, Lincoln, Canada, assignor to Chemical Waste Management Ltd., Ontario, Canada

Filed Dec. 24, 1980, Ser. No. 219,940
Int. Cl.³ F01N *3/04*; F02B *47/00*; B01D *53/34*
U.S. Cl. 60—274 **40 Claims**



1. An apparatus for disposal of polychlorinated biphenyl (PCB) liquids and the like, said apparatus comprising a substantially air-tight self-contained assembly which includes:

(a) an internal combustion engine for burning of a mixture of PCB liquids, fuel and air; and

(b) means for processing exhaust gases from the engine, said means including:

(i) at least one gas scrubber being supplied with water; and

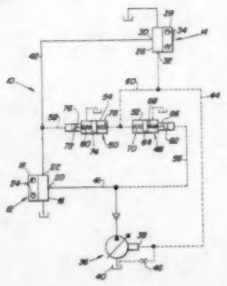
(ii) at least one gas scrubber being supplied with fuel.

4,400,937

CONTROL FOR QUICKLY EFFECTING DISPLACEMENT CHANGES IN A PUMP SUPPLYING FLUID TO PRIMARY AND SECONDARY FUNCTION CONTROL VALVES

Raymond J. Lobmeyer, Hudson, and James A. Miller, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 29, 1982, Ser. No. 427,391
Int. Cl.³ F16H *39/46*
U.S. Cl. 60—422 **3 Claims**



1. In a hydraulic system including a variable displacement pump, a pressure responsive displacement controller connected to the pump for decreasing the displacement thereof in response to receiving increasing signal pressure and vice versa, a primary function control valve including a supply inlet connected to the pump, service ports adapted for connection to a primary function and a primary function power-beyond port, at least one secondary function control valve including a supply inlet connected to the primary function power-beyond port, service ports adapted for connection to a secondary function and a secondary function power-beyond port connected to the displacement controller, the primary and second-

ary function control valves each including a pressure compensated divider for dividing flow between the respective power-beyond and service port of each valve when the latter is actuated, respectively in accordance with the fluid required by the primary and secondary functions, the improvement, comprising: lead compensating means connected to the primary function power-beyond port, to the displacement controller and to the pump for acting in response to sudden increases or decreases in the load encountered by the primary or secondary functions to generate a signal pressure for offsetting any signal pressure change resulting because of the sudden change in load, whereby the displacement of the pump remains unchanged.

4,400,938

HYDRAULIC FLUID FEEDING DEVICE FOR POWER STEERING DEVICE

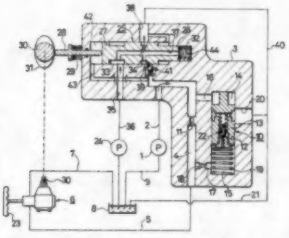
Takeshi Ohe, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1981, Ser. No. 238,527

Claims priority, application Japan, Mar. 3, 1980, 55-26300

Int. Cl.³ F15B *13/09*

U.S. Cl. 60—429 **11 Claims**



1. A hydraulic system, comprising: a power steering device; a steering wheel for operating said power steering device; a plurality of pumps for individually delivering separate flows of pressurized hydraulic fluid; a shiftable, flow path changeover valve having separate inlets for receiving separate flows of pressurized hydraulic fluid from the respective pumps, said change-over valve having outlet means connected to said power steering device and being shiftable for switching the flow paths of the pressurized hydraulic fluid delivered by said pumps whereby to feed the pressurized hydraulic fluid from said pumps to said power steering device, said change-over valve including first actuating means responsive to the magnitude of a load exerted on said power steering device for shifting said change-over valve between a first position in which the pressurized hydraulic fluid is supplied from all of said pumps to said power steering device when said load is great and a second position in which the pressurized hydraulic fluid is supplied from at least one of said pumps when said load is small.

4,400,939

DRIVE UNITS

Giampaolo Moranduzzo, Tradate, Italy; Theodor Abels, and Hans-Waldemar Stuhr, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

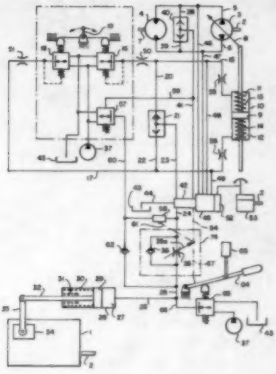
Filed Nov. 21, 1980, Ser. No. 209,257

Claims priority, application Italy, Nov. 23, 1979, 27506 A/79; Fed. Rep. of Germany, Sep. 18, 1980, 3035152

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—431 **12 Claims**

1. In a drive unit consisting of an internal-combustion engine having a speed adjusting element and a continuously variable, preferably hydrostatic transmission unit, having a pump and a regulating element operationally connected with a first adjusting piston capable of sliding in opposite directions from a central position in a first adjusting cylinder and supported against a spring on each side and is acted on by a single regulating pressure medium on one side or the other from said pump, in which case the pressure of this regulating pressure medium can be regulated as a function of a value of said engine or arbitrarily by means of one of a pair of control pressure pick-offs, the improvement comprises a comparison valve means which is a function of the control pressure pick-offs and said



engine value, a second adjusting piston capable of sliding in a second adjusting cylinder and supported against spring means and acted upon on the other side by the said single regulating pressure medium, the pressure of which is determined by the control pressure pick-offs or said engine value and means operably connecting said second adjusting piston and said speed adjusting element of the internal combustion engine whereby both the regulating element of the hydrostatic transmission unit and the speed adjusting element of the engine are controlled by the said single regulating pressure.

4,400,940

RESONANT TYPE APPARATUS FOR ABSORBING WAVE ENERGY ARRANGED AT WAVE-BREAKING FACILITIES

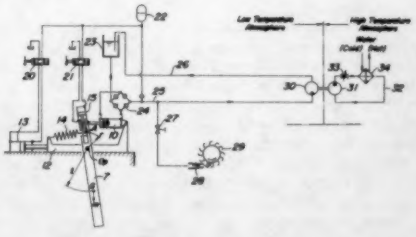
Tomiji Watabe, Noboribetsu; Hideo Kondo, Muroran; Kyokai Okuda, Muroran; Kenji Yano, Muroran, and Seiichi Asano, Takaishi, all of Japan, assignors to Muroran Institute of Technology, Muroran, Japan

Filed Feb. 26, 1981, Ser. No. 238,523

Claims priority, application Japan, Mar. 5, 1980, 55/26725

Int. Cl.³ F03B *13/12*

U.S. Cl. 60—502 **7 Claims**



1. A resonant type apparatus for absorbing wave energy arranged at wave-breaking facilities, comprising, a caisson having a bottom plate, side plates, a backside plate and a top

plate, at least a part of said top plate being omitted; a water chamber in the caisson having a length in a direction parallel to said side plates which is larger than ½ of the wave length Lc of a stationary wave generated within said water chamber, a node of said stationary wave being formed in the water chamber at a distance of Lc/4 from the backside plate; a pendulum arranged at the position Lc/4 of the node of said stationary wave for swinging with a natural period Tp which is of substantially the same value as the natural period Tw of the stationary wave; whereby the pendulum is swung by the stationary wave to absorb and convert wave energy to useful available energy at high efficiency.

4,400,941

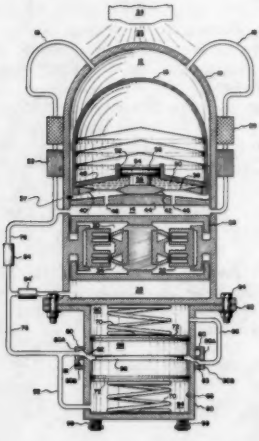
VIBRATION ABSORBER FOR A FREE PISTON STIRLING ENGINE

Jeffrey S. Rauch, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,610

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—520 **10 Claims**



1. A dynamic vibration absorber for a free piston Stirling engine having a vessel of mass M_c defining therein a cylinder in which oscillates a displacer of mass M_d for displacing working gas in a working space through a heater, a regenerator, and a cooler, and generating thereby a pressure wave in the working gas; and a power piston of mass M_p which oscillates under the influence of the pressure wave to produce output power, wherein the absorber comprises:

a fourth mass M_a sprung to said vessel by gas springs having a combined stiffness K_a that is tuned to provide with said mass M_a an absorber spring-mass system having a natural frequency equal to the operating frequency of the engine, which natural frequency varies with the engine working gas mean pressure to maintain said tune of the absorber and the engine.

4,400,942

METHOD OF CONNECTING A MASTER BRAKE CYLINDER TO A BRAKE BOOSTER AND THE ASSEMBLY RESULTING FROM THIS METHOD

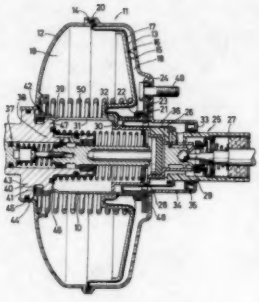
Hans-Dieter Reinartz, and Rudolf Thiel, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,416

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018271

Int. Cl.³ B60T *13/00*; F15B *9/10*

U.S. Cl. 60—547.1 **13 Claims**



1. A brake unit comprising:

a master brake cylinder; and

a brake booster including a booster casing, a movable wall disposed in said casing to subdivide said casing into a vacuum chamber and a working chamber, a reinforcing tube disposed in said casing extending axially between both transverse end walls of said casing, one end of said tube being fastened to one of said transverse end walls adjacent said working chamber, said movable wall being sealed to and axially displaceable relative to said tube, and a control valve to control the pressure in said working chamber, said tube having the other end thereof overlapping an area of an adjacent end of said master cylinder, and said tube is connected to said adjacent end of said master cylinder by a plastically deformed portion of said tube disposed in said overlapping area;

said master cylinder including an outwardly extending projection adjacent said overlapping area and said other of said transverse end walls adjacent said vacuum chamber including an axially, outwardly extending extension sealingly engaging the outer circumferential surface of said outwardly extending projection and at least a portion of a transverse wall of said outwardly extending projection remote from said overlapping area to lock said master cylinder to said booster casing.

4,400,943

BRAKE UNIT FOR AUTOMOTIVE VEHICLES

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,310

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013457

Int. Cl.³ B60T *13/20*

U.S. Cl. 60—554 **30 Claims**

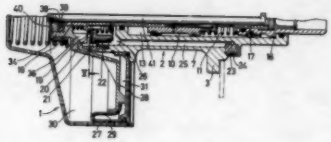
1. A brake unit for an automotive vehicle comprising:

a fluid-actuated brake booster and a brake master cylinder secured thereto between a splash-board of said vehicle and said booster, a brake-pedal force being introduced into said master cylinder at one end thereof remote from said booster;

a hollow pressure member extending through a piston of said

master cylinder to transmit said pedal force to a control element of a control valve disposed in said booster, said control valve controlling fluid supply to said booster;

a reaction device disposed in the area of at least one fluid-actuated movable wall of said booster to transmit a reaction force dependent upon a brake boosting force generated by said movable wall onto said pressure member in opposition to said pedal force; and



a tie element extending through said pressure member and said reaction device to transmit said boosting force onto said piston, said tie element carrying on its end disposed in said booster a stop disc against which said reaction device bears in the direction of said pedal force, said stop disc being an axially adjustable stop nut screwed onto said tie element.

4,400,944

AIR-FUEL RATIO CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINES

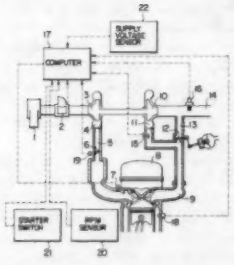
Kenzi Iwamoto, Nishio; Makoto Kuroyanagi, Hekinan; Hisasi Kawai, Toyohashi; Kunimasa Yoshimura, Susono; Hidetaka Nohira, Mishima; Mitsuyuki Ugajin, Susono, and Hisashi Ohki, Numazu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 2, 1980, Ser. No. 212,333

Claims priority, application Japan, Dec. 4, 1979, 54-157637

Int. Cl.³ F02B *37/00*; F02D *3/00*

U.S. Cl. 60—605 **15 Claims**



1. A method of controlling the air-fuel ratio of an internal combustion engine comprising the steps of:

sensing the amount of air sucked into the engine to generate an intake signal;

sensing the temperature of the exhaust gases of said engine to generate a temperature signal;

sensing the air-fuel ratio by monitoring the composition of said exhaust gases to generate a ratio signal;

discriminating whether the temperature of the exhaust gases is lower than a predetermined value on the basis of said temperature signal;

first determining with a microcomputer, in response to said intake signal and said ratio signal, the amount of fuel to be injected to cause the air-fuel ratio to approach a stoichiometric air-fuel ratio on the basis of said ratio signal when the temperature of exhaust gases is lower than said predetermined value;

second predetermining with a microcomputer, in response to said intake signal and said ratio signal the injection fuel amount to cause the air-fuel ratio to become rich on the basis of said air-fuel ratio signal when the exhaust gas temperature is higher than the predetermined value; and

injecting the fuel into said engine on the basis of said determining steps.

3. An air-fuel ratio control apparatus for an internal combustion engine comprising:

means for sensing the amount of air sucked into the engine;

temperature sensor means for sensing the temperature of the exhaust gases of said engine to generate a temperature signal;

air-fuel ratio sensor means for sensing the air-fuel ratio by monitoring the composition of said exhaust gases to generate a ratio signal;

microcomputer means, responsive to said temperature signal and said ratio signal for (1) determining response to said temperature signal whether the temperature of the exhaust gases is lower than a predetermined value; (2) determining in response to said intake signal and said ratio signal; the amount of fuel to be injected to cause the air-fuel ratio to approach a stoichiometric air-fuel ratio when the temperature of exhaust gases is lower than the predetermined value; and (3) determining in response to said intake signal and said ratio signal the injection fuel amount to cause the air-fuel ratio to become rich when the exhaust gas temperature is higher than the predetermined value; and

injector means, responsive to said microcomputer for injecting fuel into the engine.

4,400,945

SUPERCHARGED RECIPROCATING INTERNAL COMBUSTION ENGINE

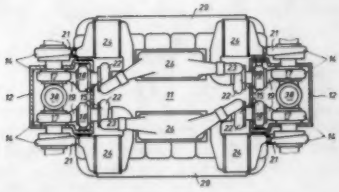
Herbert Deutschmann, Friedrichshafen, and Georg Ruetz, Immenstaad, both of Fed. Rep. of Germany, assignors to MTU Motoren-Und Turbinen-Union Friechichshafen GmbH, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 176,206

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005655

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—612 **34 Claims**



1. A reciprocating internal combustion engine which includes a plurality of exhaust gas turbocharger means for supercharging the engine, each exhaust gas turbocharger means including exhaust gas turbine means, exhaust gas conduit means, compressor means, and air conduit means for supplying supercharged air to the engine, characterized in that at least one housing means if provided for accommodating said plurality of turbocharger means,

each of said turbocharger means is adapted to be mounted in a wall of the housing means in such a manner that the turbine means and exhaust gas conduit means are located in an interior of the housing means, exhaust gas conduit means of plural turbocharger means being joined to a common exhaust gas channel within said housing, and

the compressor means and air conduit means are located exteriorly of the housing means.

4,400,946

SOLAR THERMAL POWER PLANT

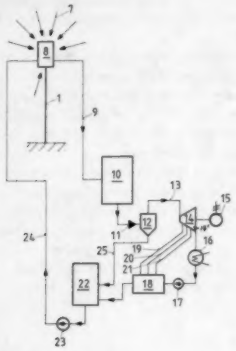
Georg Oplatka, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 28, 1980, Ser. No. 172,696

Claims priority, application Switzerland, Sep. 7, 1979, 8077/79

Int. Cl.³ F03G 7/02

U.S. Cl. 60—641.8 8 Claims



1. A solar thermal steam turbine power plant comprising:

a tower;

a radiation receiver installed at and supported by said tower;

means defining a heliostat field cooperating with the radiation receiver supported by the tower and containing reflectors for directing in a concentrated fashion the incident solar radiation onto the radiation receiver;

a hot water storage operatively associated with the radiation receiver supported by the tower and serving for storage of a work medium which has been heated-up to a predetermined operating temperature;

means for thermally charging and discharging the hot water storage;

said radiation receiver having an elongate configuration and being subdivided into a multiplicity of partial receivers;

said means for charging and discharging said hot water storage containing at least the following components:

a throttle element arranged after said hot water storage for reducing the pressure of heated water constituting said work medium in order to generate steam;

a turbine;

a condenser and a condensate pump operatively connected with said turbine;

said condenser condensing exhaust steam of said turbine into water;

a pre-heater installation arranged following said condenser and said condensate pump;

said turbine containing intermediate stage-bleed taps for bleeding steam used for heating said pre-heater installation;

a cold water container for the reception of the water delivered by the condenser and water which has not been converted by the throttling action into steam;

a water return flow line for withdrawing said water which has not been converted into steam, at a location following said throttle element, into the cold water container.

4,400,947

PRODUCING POWER FROM A CRYOGENIC LIQUID

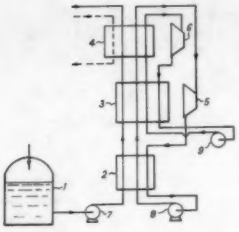
Martin S. W. Ruhemann, Sale, England, assignor to Petrocarbon Developments Limited, Manchester, England

Filed Jun. 19, 1981, Ser. No. 275,438

Claims priority, application United Kingdom, Jul. 1, 1980, 8021552

Int. Cl.³ F01K 23/04, 25/06, 9/00

U.S. Cl. 60—648 9 Claims



1. A method of producing power from a store of a cryogenic liquid containing methane, the method comprising

(a) compressing the cryogenic liquid to supercritical pressure;

(b) providing first and second closed and independent power cycles employing, respectively, first and second methane-containing heat exchange media each of which undergoes isobaric condensation over a range of temperatures;

(c) in said first closed power cycle, compressing said first heat exchange medium in condensed form to a superatmospheric pressure P_2, evaporating it, expanding the evaporated medium to a lower superatmospheric pressure P_1 in a first expansion engine, condensing the expanded vapour and recycling the condensate so formed for recompression;

(d) in said second closed power cycle, compressing said second heat exchange medium in condensed form to a superatmospheric pressure P_4, evaporating it, expanding the evaporated medium to a lower superatmospheric pressure P_3 in a second expansion engine, condensing the expanded vapour and recycling the condensate so formed for recompression; and wherein

(e) the temperature range at which the condensed first heat exchange medium evaporates at P_2 is lower than the temperature range at which the expanded second heat exchange medium condenses at P_3;

(f) the first heat exchange medium is condensed by indirect heat exchange with said compressed cryogenic liquid in a first heat exchange step at subambient temperature;

(g) the second heat exchange medium is condensed by indirect heat exchange at subambient temperature in a second heat exchange step with evaporating first heat exchange medium and with compressed cryogenic liquid recovered from said first heat exchange step; and

(h) power is taken from said first and second engines.

4,400,948

AIR DRYER

Jack F. Moorehead, 6432 Birchwood St., San Diego, Calif. 92120

Filed Dec. 28, 1981, Ser. No. 334,732

Int. Cl.³ F25B 21/02

U.S. Cl. 62—3 7 Claims

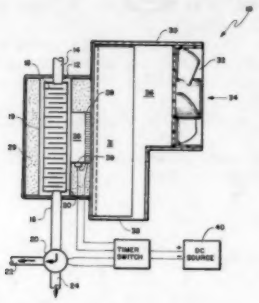
1. An improved air dryer comprising:

a heat exchanger having an air inlet and outlet with an air passage therebetween, said air passage is of finite length and has one dimension in the range of 0.020 to 0.070 inches;

a heat sink having an ambient air entrance and exit with communications therebetween;

a fan means associated with said heat sink for pulling air into said entrance, forcing air through said entrance and out said exit;

a thermoelectric module means attached to and sandwiched



between said heat exchanger and heat sink for thermocommunication therewith;

a direct current voltage supply means; and

switching means for periodically and simultaneously reversing the current to said thermoelectric module and directing the air from said outlet between a first and second exit path.

4,400,949

FROST DETECTOR FOR REFRIGERATING APPARATUS

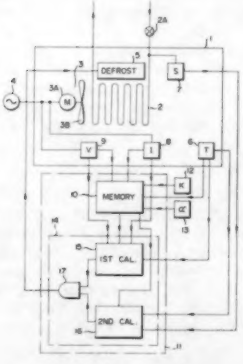
Minoru Kinoshita, Nagasaki, and Yoshio Sasaki, Nishisonogi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,874

Claims priority, application Japan, Mar. 3, 1981, 56-30913

Int. Cl.³ F25D *21/02*

U.S. Cl. 62—140 **9 Claims**



1. A frost detector for detecting a deposition of frost on an air cooler disposed in a refrigerating chamber, and for generating a defrostor activation signal when the amount of the deposition of frost reaches a predetermined level, said air cooler including piping means through which a medium flows depriving heat therefrom, air blower means for circulating air in said chamber past said piping means, and electric motor which drives said air blower means, and a defrostor means for removing frost deposited on said piping means, said frost detector comprising:

air temperature detector means disposed in said chamber for detecting the temperature T° C. of the air in said chamber, and for generating an air temperature signal corresponding to the air temperature T° C.;

piping temperature detector means disposed at said piping means for detecting the temperature S° C. of said piping means, and for generating a piping temperature signal corresponding to the piping temperature S° C.;

current detector means for detecting the current I flowing through said electric motor of said air cooler, and for generating a current signal corresponding to said current I;

voltage detector means for detecting the voltage V developed across said electric motor of the air blower, and enerating a voltage signal corresponding to said voltage V;

memory means connected with said air temperature detector means, said current detector means, and said voltage detector means, for memorizing a value T_o of said air temperature T at a time point just after a completion of a defrosting operation of said defrostor, a value I_o of said current I at said time point, and a value V_o of said voltage V at said time point;

ratio setting means for setting and memorizing a ratio K;

temperature difference setting means for setting and memorizing a temperature difference threshold value α° C.;

first calculator means connected with said air temperature detector means, said current detector means, said voltage detector means, said memory means, and said ratio setting means, for continuously determining whether or not the relation $I_o \times K \leqq I \times (V/V_o) \times (273+T)/(273+T_o)$ holds, said first calculator means including means for generating a first signal when said inequality $I_o \times K \leqq I \times (V/V_o) \times (273+T)/(273+T_o)$ holds;

second calculator means connected with said air temperature detector means, said piping temperature detector means, and temperature difference setting means, for calculating the temperature difference (T−S), and for comparing said value α with said temperature difference (T−S), said second calculator means including means for generating a second signal when $\alpha \leqq (T-S)$ holds;

a third calculator means connected with said first and second calculator means, responsive to said first and second signals, for generating a defrostor activation signal for activating said defrostor means when both said first and second signals are generated.

4,400,950

HEATING DEVICE COMPRISING A HEAT PUMP

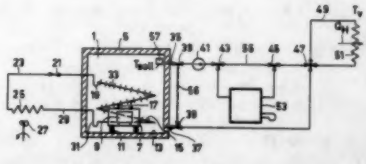
Heinrich Knabben, Kirchheimer Str. 16, D 7030 Böblingen, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,234

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024096; Jun. 27, 1980, 3024097

Int. Cl.³ F25B *27/02*

U.S. Cl. 62—238.6 **1 Claim**



1. Heating apparatus comprising a heat pump including a piston compressor, a condenser and an evaporator arranged in a closed circuit containing a heat transfer medium, the reciprocation of the piston in the compressor creating vibration; a storage vessel containing a heat storage medium, the condenser

or the evaporator being positioned within the heat storage medium in said storage vessel; a sealed housing disposed within the heat storage medium in the storage vessel, the compressor being positioned within said housing and rigidly connected to the interior thereof; means to rigidly mount the condenser or the evaporator to the exterior of said housing, the housing and the compressor and the condenser or the evaporator thereby forming a rigid unit; and springs resiliently supporting said rigid unit within the storage vessel to enable the rigid unit to be freely vibrated in the heat storage medium, the resulting vibration increasing the transfer of heat to the heat storage medium.

4,400,951

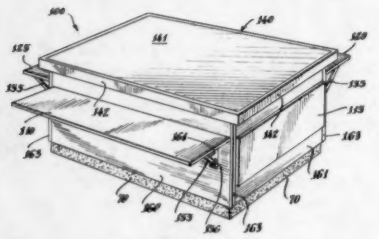
COMBINATION FOOD FREEZER/DINING TABLE

Kenneth A. Cherry, 1 Shorehaven Rd., East Norwalk, Conn. 06855

Continuation-in-part of Ser. No. 140,957, Apr. 17, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,802

Int. Cl.³ F25D *23/12*

U.S. Cl. 62—258 **12 Claims**



1. A combination food freezer/dining table comprising:

(A) a chest-type food freezer including a body having exterior end walls and exterior front and back walls, interior walls defining an open topped cavity for accepting food items and a lid connected by a hinge mechanism to the body adjacent the exterior back wall thereof, the lid pivotal between an open position permitting access to the cavity and a closed position in which the lid is disposed horizontally on the body covering the open top of the cavity; and

(B) table means secured to the food freezer and extending outwardly with respect to at least one side thereof, whereby the food freezer is adapted for use as a dining table with a user's knees accommodated under the outwardly extending table means when the user is seated at the combination food freezer/dining table, the table means including at least one table leaf hingedly mounted to one of the exterior walls of the food freezer body via a hinge mechanism and including means for supporting the table leaf in its horizontal operative position, the table leaf being pivotal to a storage position adjacent the exterior wall.

4,400,952

STITCH TRANSFER DEVICE FOR A KNITTING MACHINE

Mitsuhito Koike, and Atsushi Satoh, both of Kodaira, Japan, assignors to Silver Seiko Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,139

Claims priority, application Japan, Dec. 16, 1980, 55-176529

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—60 H **13 Claims**

1. A loop transfer device for transferring loops from knitting needles in a first needle bed to knitting needles in a second needle bed of a V-bed knitting machine, said first and second needle beds being disposed such that the needles in said first needle bed are opposed to the needles in said second needle bed, said needles having each a latch pivotable to open and close a hook thereof and being mounted in the associated needle bed for back and forth movement in a side by side relationship to each other, said loop transfer device comprising:

a carrier slidably mounted on said second needle bed;

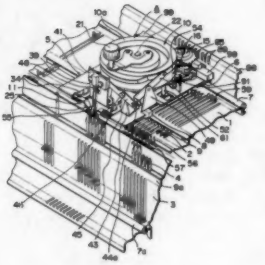
a loop transfer element for transferring a loop from a first particular needle in said first needle bed to a second particular needle in said second needle bed;

first means for mounting said transfer element for movement in an axial direction in parallel relationship with a first plane of said needles in said first needle bed;

second means for mounting said element for movement in a lateral direction;

means for advancing the second needle in said second needle bed;

means for feeding said carrier one needle space on said second needle bed; and



a single cyclically operable actuator mechanism for sequentially actuating said first and second means as well as said means for advancing and said means for feeding;

whereby said carrier is first fed one needle space on said second needle bed, said element is then moved from its initial position in a lateral direction into a position in said plane and into engagement with the first needle and then in an axial direction to push the first needle into said second needle bed whereupon the loop on the first needle is transferred onto said element and again in the opposite axial direction out of engagement with the first needle, then the corresponding second needle in said second needle bed is advanced to project its hook through the loop on said element to receive the loop from said element, and finally said element is moved in the opposite lateral direction to its initial position, thereby completing transfer of the loop from the first to the second needle.

4,400,953

APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE AND SIMILAR WEBS OF MATERIAL

Manfred Driessen, Krefeld; Walter Keller, Willich, and Johannes Kutz, Tönisvorst, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 133,394, Mar. 24, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,609

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935413

Int. Cl.³ D06B *1/14*

U.S. Cl. 68—202 **13 Claims**

1. Apparatus for the continuous treatment of webs of materials comprising:

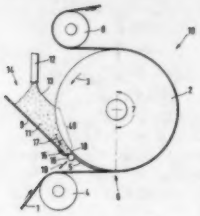
(a) a revolving cylinder, the length of which corresponds at least to the width of the web of material;

(b) means for directing the web of material onto the circumference of said cylinder at an entry point and freely looping said material around said cylinder through a loop angle;

(c) foam feeding means for transferring foam, in a transfer zone, over the length of the cylinder, directly against the circumference of the cylinder;

(d) a wiper disposed parallel to the cylinder axis following said transfer zone and spaced from the circumference of said cylinder to form a foam layer of predetermined thickness on said cylinder, said wiper being followed in the direction of rotation by said entry point; and

(e) said mean for directing including, as the last guide of the web of material before reaching said entry point, a guide roll, the circumference of which is spaced from the circumference of said cylinder a distance which exceeds the total thickness of the foam layer and the web of material.



4,400,954

STEERING LOCK ASSEMBLY

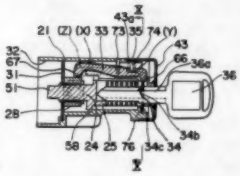
Hiromasa Nakamoto, and Akiyoshi Mentani, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd, Hiroshima and Yuhshin Co., Ltd., Tokyo, both of, Japan

Filed Apr. 6, 1981, Ser. No. 251,281

Claims priority, application Japan, Apr. 5, 1980, 55-46173[U]

Int. Cl.[3] **B60R** *25/02;* **E05B** *29/02, 65/12*

U.S. Cl. 70—186 **9 Claims**



1. A steering lock which comprises, in combination:

a lock housing including a cylinder block having an axial bore defined therein, said axial bore being constituted by first and second cavities axially aligned with each other, and a mounting block extending generally laterally outwardly from the cylindrical block and having a guide opening defined therein in communication with the first cavity;

a locking member supported movably in said guide opening for locking and unlocking an automobile steering shaft;

a cylinder lock plug operatively substantially housed in an axially non-movable fashion within the second cavity adjacent one end of the cylinder block and including a barrel, said barrel having an axially extending key groove defined therein for receiving a mating key, said barrel being rotatable through a predetermined angle between inoperative and operative positions about the longitudinal axis thereof only when the mating key inserted in said key groove is turned, said barrel including means for holding the barrel in the inoperative position in the absence of the mating key in the key groove, but for permitting the barrel to be rotatable after the insertion of the mating key in the key groove, said holding means having a capability of discriminating whether or not the mating key inserted in the key groove is correct and acceptable to the cylinder lock and accepting only the correct and acceptable key;

means coupled with said locking member for driving said locking member and housed in the first cavity for movement between locked and unlocked positions to cause the locking member to lock and unlock the steering shaft, respectively, said driving means being moved from the locked position towards the unlocked position in response to the rotation of the barrel from the inoperative position towards the operative position and also moved from the unlocked position towards the locked position in response to the rotation of the barrel from the operative position towards the inoperative position;

means operatively coupling said barrel and said driving means;

means for biasing the driving means to assume the locked position; and

a retaining mechanism for retaining the driving means in the unlocked position once the driving means has been moved to the unlocked position and so long as the mating key inserted in the key groove is left unremoved therefrom even though the barrel has subsequently been rotated from the operative position back to the inoperative position, but for releasing the driving means from the unlocked position to allow said driving means to move towards the locked position by the action of said biasing means upon withdrawal of the inserted key from the key groove, said retaining mechanism comprising a locking lever having a bearing pin extending from a substantially intermediate portion thereof in at least one direction perpendicular to the locking lever, said cylinder block having a bearing for said pin to which said pin has access from only said one end of said cylinder block said locking lever being displaceable to assume first, second and third operative positions, a biasing spring for urging the locking lever in one direction about the bearing pin, and means controllable by the mating key for permitting the locking lever to assume the first operative position during the absence of the mating key in the key groove and for causing the locking lever to assume any one of the second and third operative positions against the biasing spring depending on the position of the driving means during the presence of the mating key in the key groove, said locking lever being engaged with the driving means to lock the driving means in the unlocked position when in the second position and disengaged from the driving means when in any one of the first and third positions;

said cylinder block having an elongated chamber defined therein and extending axially of the cylinder block in communication with the second cavity, said second cavity and said elongated chamber each having first and second open ends at the opposite ends of said second cavity with respect to each other which are open at annular end faces on the cylinder block opposite from the first cavity and towards the first cavity, respectively, said locking lever being displaceably held in position inside the elongated chamber by insertion through the first open end in a direction axially thereof along the longitudinal extent of the cylinder block.

4,400,955

DUPLEX LOCK

Benito Di Motta, via Palestro, Cooperativa "Osiride", 84100 Salerno, Italy

Filed Oct. 19, 1981, Ser. No. 312,463

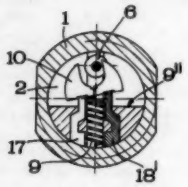
Claims priority, application Italy, Nov. 3, 1980, 64817 A/80

Int. Cl.[3] **E05B** *15/14, 29/02, 35/12*

U.S. Cl. 70—339 **6 Claims**

1. In a duplex lock codable by a master key and releasable by a duplex key and having a first fixed hollow cylindrical body adapted to be secured to a movable element to be opened and closed and a second substantially cylindrical body rotatably mounted within a cylindrical cavity in said first hollow cylin-

drical body, the improvement comprising an axially movable slider for locking said movable cylindrical body to said fixed cylindrical body, said slider being secured to said movable body but adapted to be coupled under the action of spring means to said fixed body, said spring means causing said slider to be inserted in a locking recess in a bottom wall of said fixed body; said slider being provided with a plurality of axially spaced radial recesses of frustoconical shape tapering toward said locking recess; said movable body being provided with a plurality of axially spaced radial apertures adjacent said radial recesses in said slider; a U-shaped rocker lever in each of said radial apertures, each of said U-shaped rocker levers having a U-shaped forward open end facing said slider; spring means secured to a rear end of each of said U-shaped rocker levers along a center line of said U-shaped forward ends thereof to bias said U-shaped rocker levers away from said slider, said spring means tending to urge said U-shaped rocker lever with said rear ends thereof toward an abutment surface provided in the interior of said movable cylindrical body; a pair of radial



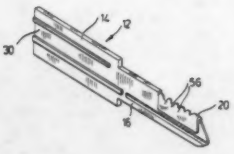
keyholes in said movable cylindrical body for receiving each of said master and duplex keys, said keyholes extending symmetrically relative to a plane located perpendicularly of said abutment surface; said master key forming the coding of the lock and being normally retained therein and said duplex key having the same coding as said master key; insertion of said master key into the lock in the locked position of said slider causing said U-shaped forward open ends of said U-shaped rocker levers engaging said master key to be lifted and swung toward said radial recesses in said slider to prevent the latter from withdrawing from its locked position and insertion of said duplex key into the lock causing said U-shaped forward open ends of said U-shaped rocker levers to be lifted and swung to the same extent in the opposite direction relative to said slider, said latter swinging movement of said U-shaped rocker levers causing centering of said slider relative to said U-shaped rocker levers to permit said slider to withdraw axially through said U-shaped forward ends of said rocker levers to release said first and second cylindrical bodies and thus open the lock.

4,400,956

SKELETON KEY KIT

William E. Martin, Hamilton, Canada, assignor to Martin & Starchuk Limited, Dundas, Canada

Filed Aug. 5, 1981, Ser. No. 290,037
Int. Cl.³ E05B *19/20*
U.S. Cl. 70—394 **11 Claims**



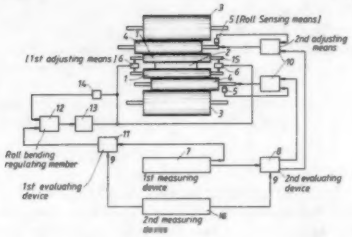
1. A key kit for opening tumbler locks comprising a key member having a shaft insertable into a tumbler lock, said shaft having a series of longitudinally-spaced recesses into which the tumblers in the lock can respectively enter, a foil of impressionable material removably positionable on the shaft over the recesses, and a tumbler displacing member insertable into the lock with the shaft and foil to displace the tumblers without the tumblers engaging the foil, said tumbler displacing member being removable from the lock after the shaft and foil have been inserted therein to enable the key member to be manipulated to cause the tumblers to make impressions in the foil corresponding to the key shape required to open the lock.

4,400,957

STRIP OR SHEET MILL WITH IMPROVED REGULATING DEVICE AND METHOD

Anders Carlstedt, and Ake Nilsson, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Apr. 22, 1981, Ser. No. 256,605
Claims priority, application Sweden, Apr. 25, 1980, 8003137
Int. Cl.³ B21B *37/12, 31/18, 31/20*
U.S. Cl. 72—8 **7 Claims**



1. A strip or sheet rolling mill which includes a pair of working rolls between which the strip or sheet passes; a pair of backup rolls, one backup roll being associated with one working roll; a pair of axially displaceable intermediate rolls, one intermediate roll being positioned between a working roll and its associated backup roll; and a regulating system for the mill, said regulating system comprising

first adjusting means for adjusting the crown of the working rolls, the first adjusting means being hydraulically operated,

second adjusting means for adjusting the axial position of the intermediate rolls relative to their associated working and backup rolls,

a first measuring device positioned downstream of the working rolls for measuring the flatness of the rolled strip or sheet and for generating a corresponding flatness signal,

a second measuring device positioned downstream of the working rolls for measuring the width of the rolled strip or sheet and for generating a corresponding width signal,

a hydraulic supply means for supplying hydraulic fluid to the first adjusting means, the hydraulic supply means including a control valve,

a regulating means connected to the control valve to control its operation,

a third measuring device for measuring the pressure in the hydraulic supply means and for providing a corresponding pressure signal which is passed to the regulating means,

a first evaluating device to which the flatness signal and the width signal are fed, the first evaluating device providing a first control signal which is fed to the regulating means,

a second evaluating device to which the flatness signal and the width signal are fed, the second evaluating device providing a second control signal which is fed to the second adjusting means to control its operation,

the regulating member controlling the operation of the control valve in the hydraulic supply means based on both the received pressure signal and the first control signal to

thereby control the operation of the first adjusting means and thus the crown of the working rolls.

5. A method of regulating a strip or sheet rolling mill, which mill includes a pair of working rolls between which the strip or sheet passes; a pair of backup rolls, one backup roll being associated with one working roll; a pair of axially displaceable intermediate rolls, one intermediate roll being positioned between a working roll and its associated backup roll; hydraulic first adjusting means for adjusting the crown of the working rolls; second adjusting means for adjusting the axial position of the intermediate rolls relative to their associated working and backup rolls; a hydraulic supply means including a control valve for supplying hydraulic fluid to the first adjusting means; and a regulating member for controlling the control valve; the method comprising the steps of measuring the flatness of the strip or sheet emanating from between the working rolls and providing a flatness signal based thereon, measuring the width of the strip or sheet emanating from between the working rolls and providing a width signal based thereon; measuring the pressure of the hydraulic fluid in the hydraulic supply means and providing a pressure signal based thereon; comparing the flatness signal and the width signal to provide first and second control signals; passing the first control signal and the pressure signal to the regulating member to enable it to control the control valve and thus the operation of the hydraulic first adjusting means; and passing the second control signal to the second adjustment means to control its operation.

4,400,958

SYSTEM FOR MEASURING THE THICKNESS OF A STRIP EMERGING FROM A ROLLING MILL

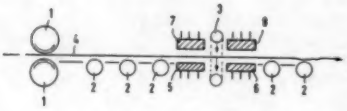
Werner Engelhardt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,996

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029337

Int. Cl.³ B21B *37/02*

U.S. Cl. 72—16 **4 Claims**



1. An arrangement for measuring a strip emerging from a rolling mill, the arrangement having a thickness-measuring device, the arrangement further comprising at least one linear inductor arranged in the vicinity of the thickness-measuring device whereby said linear inductor generates a traveling field which exerts upon the strip a tensile force for flattening the strip in the vicinity of the thickness-measuring device, thereby improving the accuracy of a thickness measurement of the strip by the thickness-measuring device.

4,400,959

EXTRUDER FOR THE FORMATION OF A BRANCH ON A PIPE

Gérard Reigner, La Guerche-de-Bretagne, and Yves Bréger, Laval, both of France, assignors to Europe Outillage S.A., La Guerche-de-Bretagne, France

Filed Apr. 20, 1981, Ser. No. 255,481

Claims priority, application France, Apr. 24, 1980, 80 09269

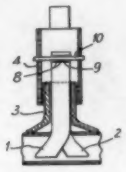
Int. Cl.³ B21D *19/00*

U.S. Cl. 72—112 **4 Claims**

1. An extruder for forming a branch on a pipe in which a lateral opening has been provided, said extruder comprising:

(a) a tool defined by a first arm and a second arm, each of said arms having a stem and a bent end at one end of said stem, said arms pivotally connected at a pivot point adjacent said bent ends, said stems each including an upper end having attachment means;

(b) a mandrel having a first part positionable around the lateral opening in the pipe and a second part rotatably positioned relative to said first part for linear movement relative to the pipe opening;



(c) said attachment means on each of said stems engageable with said second part of said mandrel through a common connection; and

(d) means to permit rotation of said second part of said mandrel relative to said first part to cause said arms to move laterally relative to the pipe.

4,400,960

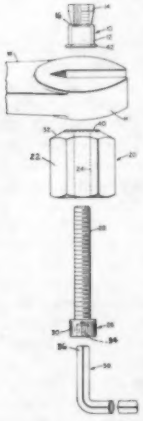
TOOL FOR SETTING BLIND FASTENERS

Alan Martin, 42 Lantern La., Sharon, Mass. 02067

Filed May 13, 1981, Ser. No. 263,140

Int. Cl.³ B21J *15/34*

U.S. Cl. 72—114 **2 Claims**



1. A hand tool for setting threaded blind fasteners having a body and internally threaded base which in the preset condition are axially aligned and connected end to end with one another by a fracturable shoulder, said fastener when set having its base lying within the body with the shoulder fractured and expanding the body to hold it in position comprising

a sleeve having a hexagonal outer surface sized to be engaged by a conventional open end wrench against rotation and having a bore therethrough and a fixed anvil at its end to engage the fastener body to prevent it from rotating,

a threaded bit rotatably mounted in the sleeve and extending out of the sleeve and being sized to enable one end to thread into the base of the fastener to be set by the tool with the free end of the body of the fastener bearing against the anvil of the sleeve,

and an Allen wrench socket at the other end of the bit and an Allen wrench to be received by the socket for rotating the bit relative to the sleeve to fracture the shoulder of the

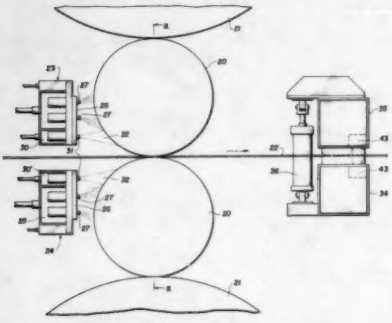
fastener and draw the base of the fastener into the body thereof.

4,400,961

APPARATUS FOR REMOVING LIQUID COOLANT FROM METAL STRIPS IN A ROLLING MILL

Edward J. Schaming, P.O. Box 1070, Butler, Pa. 16001

Filed Jul. 15, 1981, Ser. No. 283,644
Int. Cl.³ B21B 27/10, 45/02
U.S. Cl. 72—201 5 Claims



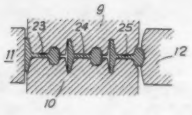
1. In a metal strip rolling mill which includes at least a pair of working rolls one above the other and between which a metal strip travels on a substantially horizontal path of movement, a pair of coolant distribution headers disposed near the upstream sides of the working rolls, one above and one below the metal strip, remotely controllable liquid coolant distribution nozzle units on said headers in communication therewith and delivering liquid coolant onto the upstream sides of the working rolls at least across the width of the metal strip, a pair of pneumatic headers extending along the bottom and top of the coolant headers, compressed air nozzle units which are remotely controllable connected with said pneumatic headers and adapted to direct the streams of compressed air onto the upstream faces of the working rolls near and above and near and below the metal strip, the compressed air nozzle streams being directed toward the two longitudinal edges of the metal strip and toward the opposite end portions of the working rolls which extend outwardly of the strip longitudinal edges to thereby prevent most of the liquid coolant delivered onto the upstream sides of the working rolls from passing through the rolls and downstream thereof, another pair of headers disposed slightly downstream of the working rolls, one above and one below the metal strip and spanning the width of said strip, the last-named headers having opposing evacuation slots across the top and bottom face of said strip in closely spaced relationship thereto, said evacuation slots being disposed near the upstream sides of the last-named headers with respect to the direction of movement of the strip, means connected with the last-named headers to evacuate their interiors, whereby the evacuation slots can remove air suspended liquid coolant particles from the regions close to the strip and last-named headers on opposite sides of the strip, and compressed air nozzle means on the last-named headers near and slightly downstream from the evacuation slots and being adapted to deliver multiple streams of compressed air onto opposite sides of the strip in somewhat upstream directions to lift liquid coolant remaining on the strip therefrom and rendering such coolant airborne in the vicinity of the evacuation slots.

4,400,962

IMPROVED ROLLING MILLS APPARATUS FOR ROLLING RAILS WITH UNIVERSAL AND EDGING PASSES WHEREIN EDGING PASSES ARE MADE IN A REVERSING UNIVERSAL FINISHING STAND

Jacques M. Michaux, Joeuf, France, assignor to Sacilor Acieries et Laminoirs de Lorraine, Hayange, France

Filed Sep. 10, 1981, Ser. No. 300,913
Claims priority, application France, Sep. 15, 1980, 80 19853
Int. Cl.³ B21B 1/08
U.S. Cl. 72—222 6 Claims



1. An improved rolling mill for rolling rails from a rail blank, with universal and edging passes, including one universal finishing stand having two horizontal rolls and at least one vertical roll to provide a semi-universal finishing groove, said rolling mill further including at least a reversing universal stand and a reversing edging stand providing a single edging groove further including a means to align the rail blank with grooves with all said stands being arranged along a straight line, wherein the improved rolling mill comprises:

at least one reversing edging stand for forming a single edging groove;

at least one reversing universal stand, said reversing universal finishing stand including means for forming a semi-universal finishing groove and at least one edging pass formed by at least one edging groove made in the horizontal rolls; and

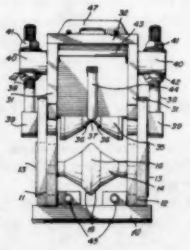
means for aligning the rail blank with the groove of the reversing universal finishing stand selected to roll it.

4,400,963

ROLLER ENTRY GUIDE FOR ANGLES

Fred A. Epps, Manitoba, Canada, assignor to AMCA International Limited, Montreal, Canada

Filed Dec. 9, 1981, Ser. No. 329,066
Int. Cl.³ B21B 39/16
U.S. Cl. 72—250 7 Claims



1. Roller entry guide assembly for rolling straight angle shapes, comprising

a support frame,

two bottom rollers rigidly mounted in a horizontal plane in

the support frame, each of the bottom rollers having sides contoured to fit an angle configuration with the largest diameter at the center,

means for mounting the two bottom rollers for free rotation,

a top roller positioned above and between the two bottom rollers, and parallel thereto, the top roller being adjustably mounted from the support frame to vary the height above the bottom rollers, the top roller having sides contoured to fit an angle configuration with the smallest diameter at the center adapted to guide and position an angle shape between the top and bottom rollers in conjunction with the bottom rollers, and

means for mounting the top roller for free rotation so that a straight angle shape is freely advanced between the top roller and both bottom rollers without deforming the straight angle shape.

4,400,964

METHOD AND DEVICE FOR CONTINUOUS PRODUCTION OF FLANGED HOLLOW ARTICLE

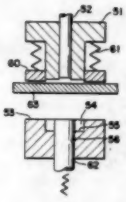
Kazuyoshi Kondo, Okazaki, and Yoshiaki Nakamura, Tsu, both of Japan, assignors to Kabushiki Kaisha Wako, Iwata, Japan

Continuation of Ser. No. 950,978, Oct. 13, 1978, abandoned, which is a division of Ser. No. 843,886, Oct. 20, 1977. This application Oct. 2, 1980, Ser. No. 193,221

Claims priority, application Japan, Oct. 21, 1976, 51-126553

Int. Cl.³ B21C *23/14, 25/04;* B21D *45/00*

U.S. Cl. 72—265 **1 Claim**



1. A method for continuously producing hat-shaped hollow articles each having a flange, which comprises the steps of:

feeding a planar strip material between a punch member for punching the outer contour of the flange and a die member having a die hole with a bottom, said punch member and die member being disposed in an opposed and mutually approachable relation so that said strip material is clamped between said members, said punch member being provided with a mandrel adapted to pass slidably through a central hole thereof and having an outer contour corresponding to the inner contour of the internal hole of the article, and said die member being provided with a central through hole having a diameter corresponding to the outer diameter of the hollow part of the article and having an ejector provided slidably in said central through hole;

pressing said punch member toward said die hole of the die member so that a blank piece having a peripheral outer surface corresponding to that of the flange of said article is firstly cut out of said strip material and is dropped in said die hole, then continuing the pressing together of said punch and die members so that the flange of the blank piece is press-formed while causing a flow and protrusion of the blank material into said through hole of the die member so as to form a recess hole in the blank material;

projecting said mandrel of the punch member into said recess hole of the blank material simultaneously with said pressing while retracting said ejector thereby to form completely the hollow part of the article;

returning said punch member, die member, mandrel and ejector to their respective starting positions to thereby eject a completely shaped article;

shifting the strip material by one step of a predetermined distance; and

repeating the above-mentioned steps upon said shifting of the strip material.

4,400,965

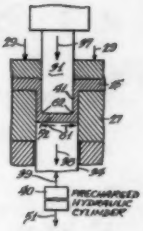
FORMING INTEGRAL FLANGES IN A SHEET APPARATUS THEREFORE

John A. Schey, Waterloo, Canada, assignor to Modine Manufacturing Company, Racine, Wis.

Division of Ser. No. 134,513, Mar. 27, 1980, Pat. No. 4,373,369. This application Aug. 18, 1982, Ser. No. 409,702

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—334 **4 Claims**



1. An apparatus for forming a plate structure including an integral depression, comprising: clamp means for clamping said plate except at an area corresponding to the location of said depression; a punch engaging one side of said plate at said depression area; a counterpunch on the other side of said plate opposite to said punch and having a cross-sectional area greater than the area of said punch, the difference in extent of said area defining the thickness of the side walls of said depression, said punch and counterpunch being movable in the same direction but at different rates, said counterpunch supported by resistive means to create sufficient pressure in said area of said plate to cause metal displaced from the area between said punch and counterpunch to be laid upon the internal surface of a confining die in which said counterpunch is slidably mounted, to produce a depression in said plate having heavily deformed walls and a base thinner than said plate.

4,400,966

TOOL FOR FORMING A LATERAL OPENING IN A TUBE

Gerd-Jurgen Eckold, St. Andreasberg, and Hans MaaB, Bad Lauterberg, both of Fed. Rep. of Germany, assignors to Walter Eckold GmbH & Co., St. Andreasberg Sperrluttertal, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,585

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009749

Int. Cl.³ B21D *19/00*

U.S. Cl. 72—392 **7 Claims**

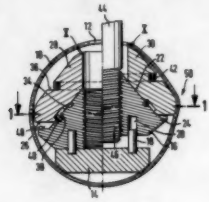
1. A tool for forming a lateral opening in a tube or pipe at a location determined by an aperture of lesser diameter in a sidewall thereof, comprising, in combination;

an elongated body member sized and adapted to be adjustably, longitudinally disposed internally and adjacent to such aperture in the sidewall of the tube;

a wedge member laterally movably disposed on said body member for adjustable disposition laterally outwardly of said tube, said wedge member including means for cooperative engagement with a means for moving said wedge member laterally outwardly of the tube at said aperture and having wedge surfaces symmetrical to the direction of movement thereof;

and a plurality of sector shaped spreader bodies to move

with the wedge member laterally outwardly of the tube and to spread from each other transversely of said laterally outward movement, the spreader bodies having internal wedging surfaces in sliding, cooperative disposition on the wedging surfaces of said wedge member to be spread thereby, the spreader bodies having outer arcuate forming surfaces with peripheral portions facing transversely of the laterally outward movement of the wedge member and configured to engage, displace and distend the tube sidewall circumferentially of the aperture in the tube, said forming surfaces also having rounded abutting surface portions facing endways of the laterally outward move-



ment of the wedge member and configured to abut the inner periphery of the tube sidewall adjacent the aperture therein as the wedge member is moved laterally outwardly to cause spreading of the spreader bodies from a retracted position whereat the diameter of said peripheral surface portions is less than the diameter of said tube, to an extended position whereat the diameter of said peripheral surface portions, is greater than the diameter of said tube, whereby to distensibly form the tube sidewall around the aperture and produce such a lateral opening in the tube as the wedge member is moved laterally outwardly of the tube.

4,400,967

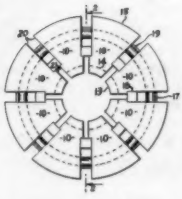
CRIMPING COLLET

Carl H. Owens, 1652 River Bluff Rd., Jacksonville, Fla. 32211

Filed Aug. 31, 1981, Ser. No. 298,167

Int. Cl.³ B21D *41/00*

U.S. Cl. 72—402 **10 Claims**



1. A collet for crimping a metallic fitting onto a flexible elastomeric hose which comprises a generally cylindrical structure having a top surface, a bottom surface, an outer circumferential surface, and a central axial bore adapted to encircle the fitting and the hose, said structure including a plurality of separate identical radial sectors, each adjacent pair of said sectors being separated from each other by an elastomeric pad bonded to only one said sector of said pair, each said sector having a groove in its outer surface forming said circumferential surface, said structure including at least one circumferential elastomeric ring engaged in each said groove to elastically retain said sectors together as a unit and permitting contraction and expansion of said collet, each said sector being individually removable and replaceable without disturbing any bonding of said pad to one said sector.

4,400,968

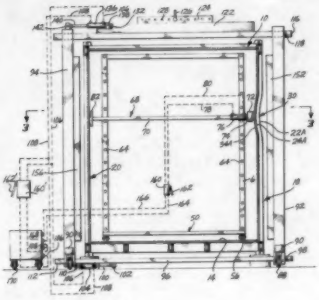
APPARATUS FOR REFORMING DEFORMED CONTAINER STRUCTURES AND THE LIKE

Louis C. Barbieri, 9407 E. Marginal Way, Seattle, Wash. 98108

Filed Apr. 20, 1981, Ser. No. 255,368

Int. Cl.³ B21J *13/04;* **B21D** *1/12*

U.S. Cl. 72—457 **11 Claims**



1. Apparatus for reforming a container structure having spaced apart sidewalls interconnected by a top and a floor, comprising:

a reaction frame movable relatively along said container, said reaction frame comprising a separate vertical side member positionable outwardly adjacent each side of the container, adjustable connector means interconnecting the vertical side members both above and below the container, said connector means being extendable for moving the vertical side members apart and retractable for moving the vertical side members together, and carriage means supporting the movable frame for movement lengthwise of the container; and

an extendable-retractable power ram operable for applying a force, from within the container, against a sidewall portion of the container, said power ram having a forming end and a reaction end,

whereby the frame can be moved longitudinally of the container until a first of said vertical side members is positioned immediately outwardly of a deformed sidewall portion of the container, and said adjustable connector means can be retracted for the purpose of bringing said first vertical side member into a backup position adjacent the deformed portion of the sidewall and at the same time bringing the other vertical side member into a bracing position against the opposite sidewall of the container, and the ram can be positioned inside the container in alignment with said vertical side members, with its forming end against the inner side of the deformed portion of the sidewall and its reaction end against the opposite sidewall, and the ram can then be extended to apply a force against the sidewall to tend to remove the deformation therein, and the force of the ram will be reacted into the reaction frame.

4,400,969

APPARATUS FOR SECURING A VEHICLE TO BE STRAIGHTENED

Gerald A. Specktor, St. Paul, Minn., assignor to Align-Tech, Inc., St. Paul, Minn.

Filed Jun. 26, 1981, Ser. No. 277,872

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—457 **9 Claims**

1. An apparatus for securing a vehicle to be straightened

with a vehicle straightening device and attached to a horizontal support, the apparatus comprising:

a detachable base;

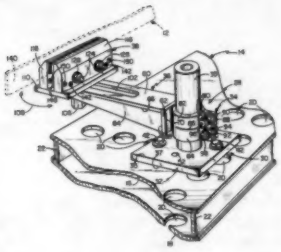
means for securely attaching the base to the support in a fixed spatial relationship with respect to the vehicle straightening device in any of a plurality of positions;

clamping means for securely holding the vehicle to be straightened by clamping a vehicle portion, the clamping means including:

a base plate;

a fixed jaw permanently attached to an upper surface of the base plate;

a movable jaw slidably movable along the top surface of the base plate with respect to the fixed jaw, the movable jaw having a plurality of threaded apertures and further comprising a plurality of set screws positioned in the threaded apertures and threadably extending through the movable jaw with distal ends engaging the fixed jaw



such that the movable jaw is adjustable to a substantially parallel position with respect to the fixed jaw by threadably moving the set screws against the fixed jaw; and

a plurality of threaded fasteners above the threaded apertures extending through both the movable and the fixed jaw such that the movable jaw is placed in a clamping position clamping a vehicle portion by tightening the threaded fasteners;

first positioning means attached to said detachable base for pivotally positioning the clamping means about a first substantially vertical axis and for positioning the clamping means in a substantially vertical direction; and

second positioning means for pivotally positioning the clamping means about a second substantially vertical axis spaced from the first vertical axis such that the clamping means is positionable about the second vertical axis for clamping the vehicle portion in a continuum of spatial positions.

4,400,970

METHOD OF AND APPARATUS FOR MEASURING IN SITU, THE SUB-SURFACE BEARING STRENGTH, THE SKIN FRICTION, AND OTHER SUB-SURFACE CHARACTERISTICS OF THE SOIL

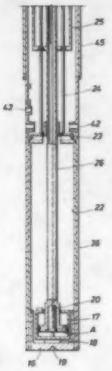
Muhammad A. Ali, 10507 Odessa Dr., Sugar Land, Tex. 77478

Filed Sep. 24, 1981, Ser. No. 305,082

Int. Cl.³ G01N *19/02, 3/42*

U.S. Cl. 73—9 **6 Claims**

1. A method of determining the bearing capacity and the skin friction of a soil in situ, comprising the steps of pushing a probe into the soil to the desired depth, said probe having three relatively movable, concentric, members with the center member comprising a plunger having a flat face for exerting a downward force in the soil across the area of the flat face, an inner tubular member, and an outer tubular member, measuring the pore pressure of the soil ahead of the probe, raising the probe until the pressure acting on the flat face of the plunger equals the pressure of the overburden to remove the stress created in the soil by the insertion of the probe, moving the outer tubular member to eliminate skin friction forces on the member, measuring the net movement of the probe and the outer tubular member required to eliminate soil stress, moving the plunger and inner tubular member downwardly into the soil below the probe, measuring the soil resistance to such movement over a given distance to obtain a force vs distance



curve, moving the plunger and inner tubular member upwardly the predetermined distance required to relieve the stress in the soil, moving the plunger downwardly into the soil a preselected distance measuring the force required to obtain a force vs distance curve for the plunger, and calculating the actual soil end bearing resistance and skin friction from the two curves and known values of metal-to-metal and seal friction.

4,400,971

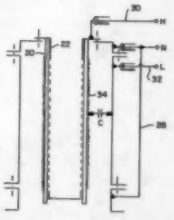
METHOD AND MEANS FOR MEASURING PARTICULATE MATTER ON A FILTER

Owen J. Tassicker, Cupertino, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 29, 1981, Ser. No. 268,279

Int. Cl.³ B01D *46/00;* **G01D** *21/00*

U.S. Cl. 73—28 **7 Claims**



1. A method of determining the amount of particulate matter on a fabric filter comprising the steps of

providing a first electrode on which said fabric filter is mounted,

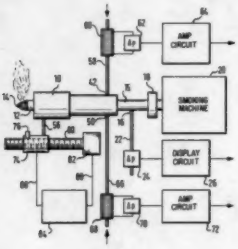
providing a second electrode in association with one end of said first electrode, providing a second electrode in association with another end of said first electrode, and providing a plurality of fourth electrodes between said second and third electrodes and in association with said first electrode, and

determining the capacitance between said first electrode and said plurality of fourth electrode-.

4,400,972
APPARATUS FOR DETERMINING THE FLOW BEHAVIOR OF A SMOKABLE ARTICLE

Wolfgang Wiethaup, Hamburg, Fed. Rep. of Germany, assignor to B.A.T., Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,705
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1980, 3002244
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **18 Claims**



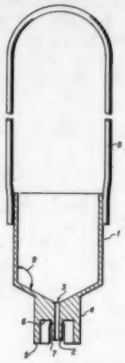
1. An apparatus for determining the flow characteristics of a smokable article said apparatus comprising:
(a) a smoking machine;
(b) holding means, coupled to said smoking machine, for holding said smokable article;
(c) air-tight enclosed chamber means, movably mounted on said holding means, for enclosing at least a portion of said smokable article, said chamber means including a first chamber for enclosing a strand portion of the smokable article, a secod chamber for enclosing a filter portion of the smokable article, a first gas intake means coupled to said first chamber and a second gas intake means coupled to said second chamber; and
(d) flow characteristic measuring means, coupled to said holding means, for measuring the flow characteristics of gas from said gas intake means through said smokable article.

4,400,973
EFFLUX VISCOSITY CUP

Allan J. Hegedus, Bolingbrook, Ill., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,547
Int. Cl.³ G01N *11/04*
U.S. Cl. 73—56 **4 Claims**

1. In an efflux viscosity cup consisting essentially of a cylindrical cup with a conical bottom, a capillary joined to the apex of said conical bottom which apex is provided with an orifice, said cylindrical cup, conical bottom and capillary being coaxially oriented with one another, and a coaxially oriented cylindrical protective collar having an inner diameter substantially larger than the outer diameter of said capillary and attached thereto by a land located at about the midpoint along the length of the capillary, said collar extending beyond the exit orifice of the capillary by about two millimeters, the improvement whereby increasing the reproducibility of measurements made with said cup, which comprises including in said collar a

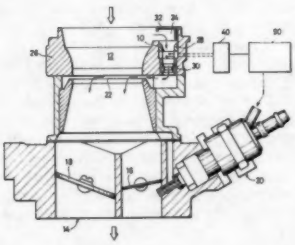


slot with sides perpendicular to the base of the collar and extending from the base at least to the land.

4,400,974
INTAKE AIR AMOUNT DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yutaka Nishimura; Yoshishige Oyama, both of Katsuta; Tadashi Kirisawa, Hitachi; Hiroshi Kuroiwa, Hitachi; Minoru Osuga, Hitachi, and Yasunori Mouri, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 285,278
Claims priority, application Japan, Jul. 15, 1980, 55-97324
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **8 Claims**



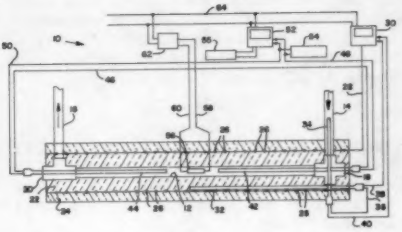
1. An intake air amount detecting system for internal combustion engines comprising in combination:
(a) at least one temperature-dependent resistor disposed in an intake air path of the internal combustion engine;
(b) power-supply means for feeding a heating current to said temperature-dependent resistor;
(c) feedback means which adjusts said heating current in response to the change in resistance of said temperature-dependent resistor so as to maintain the temperature of said temperature-dependent resistor constant;
(d) signal adjusting means connected to receive a signal that represents said heating current for adjusting said signal to lag more when the signal decreases than when the signal rises; and
(e) converter means connected to the output of said signal adjusting means for converting said output into a signal representing the intake air flow rate of the internal combustion engine.

4,400,975

APPARATUS FOR MONITORING LIQUID FLOW RATES

John W. McGarr, Griffith, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 27, 1981, Ser. No. 267,498
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 9 Claims



1. An apparatus adapted to monitor the flow rate of a liquid comprising:

(a) conduit means through which said liquid is caused to flow, said conduit means having a liquid inlet through which said liquid enters said conduit means and a liquid outlet through which said liquid exits said conduit means;

(b) heating means associated with said conduit means and adapted to supply heat at a substantially constant rate to said liquid in said conduit means;

(c) temperature control means associated with said conduit means and comprising first temperature sensing means adapted to sense the temperature of said liquid entering said conduit means; second temperature sensing means adapted to sense the temperature of the area outside and adjacent to said conduit means; temperature maintenance means located in spaced relation to said area outside of and adjacent to said conduit means; and controller means associated with said first and second temperature sensing means and said temperature maintenance means and adapted to increase or decrease the amount of heat supplied to said temperature maintenance means in response to the difference in temperatures sensed by said first and second temperature sensing means, thereby maintaining said area outside of and adjacent to said conduit means at substantially the same temperature as said liquid entering said conduit means;

(d) upstream temperature sensing means associated with said conduit means and adapted to sense the temperature of said liquid in said conduit means at a point prior to said heat being supplied to said liquid; and

(e) downstream temperature sensing means associated with said conduit means and adapted to sense the temperature of said liquid in said conduit means at a point after said heat has been supplied to said liquid, whereby the difference in temperatures sensed by said upstream and downstream temperature sensing means is proportional to the flow rate of said liquid in said conduit means.

4,400,976

ULTRASONIC TRANSCEIVER CIRCUIT FOR LEVEL SENSING

Frederick K. Blades, Boulder, Colo., assignor to PureCycle Corporation, Boulder, Colo.

Filed Jul. 2, 1980, Ser. No. 165,253
Int. Cl.³ G01F 23/28; G01N 29/00
U.S. Cl. 73—290 V 2 Claims

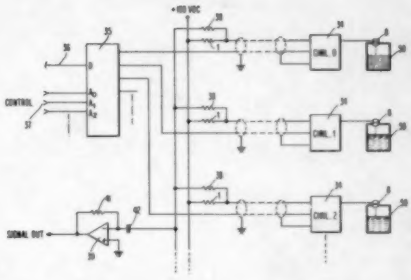
1. A system for monitoring the level of materials contained in one or more vessels, comprising:

one or more remote transducers connected to respective transceivers and located at said vessels;

a central controller for providing control signals and energy to said transceivers and for receiving signals from said transceivers and converting said received signals into signals indicative of the level of materials in said vessels; and

conductor means connecting said transceivers and said controller at a distant location from said vessels, each of said transceivers selectively activated for operating in a first quiescent mode and a second active mode, the transition from said first to said second modes being initiated by control means at said distant location, each said transceiver comprising:

capacitor means connected to said conductor means during said first mode for storage of energy provided from said distant location;



means for effectively disconnecting said capacitor means from said conductor means at the time of transition from said first to said second mode;

power supply means for applying energy stored in said capacitor to said transducer to cause an ultrasonic signal to be emitted therefrom;

electrostatic means for detecting the reflected ultrasonic signal, said means being biased for detection by energy stored in said capacitor means;

means for amplifying said detected signal and transmitting said amplified signal over said conductor means; and

means for reconnecting said capacitor means to said conductor means at the end of said second mode.

4,400,977

COMBINED INDICATING APPARATUS FOR SCUBA DIVERS

Pavel Gross, Hintertrottenstr .280, CH-5326, Renigen, and Jaroslav Kohout, Erbslet 373, CH-5234, Villigen, both of Switzerland

Filed Feb. 12, 1981, Ser. No. 234,054
Claims priority, application Sweden, Mar. 1, 1980, 1605
Int. Cl.³ G01G 5/00
U.S. Cl. 73—432 R 6 Claims

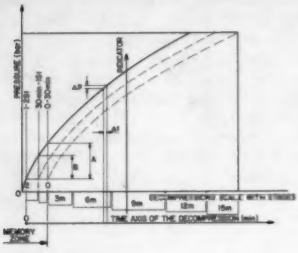
1. A compressed air manometer device for scuba divers for use in combination with a known decompressionmeter having a scale and indicator, wherein the compressed air manometer device comprises:

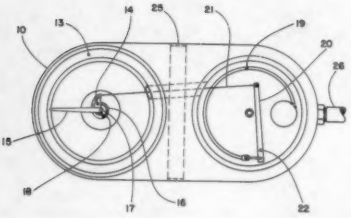
a housing connected to a source of compressed air, and having at least one transparent portion with a scale imprinted thereon, wherein the interior of the housing is visible;

an indicator mounted in said housing, and responsive to the amount of compressed air remaining in the said source of compressed air;

and means for mounting the transparent portion of the housing over the scale and indicator of said known decompres-

sionmeter, in a superimposed relationship, whereby the scales and indicators of the combined decompressionmeter and the compressed air manometer device will be visible.



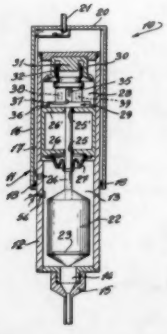


4,400,978

ELECTRONIC HYDROMETER AND METHOD OF DETERMINING THE DENSITY OF A LIQUID

Raymond Guay, Dollard des Ormeaux, and Pierre R. Moffatt, Ste-Therese, both of Canada, assignors to Louis Boivin, Quebec, Canada

Filed Sep. 1, 1981, Ser. No. 298,507
Int. Cl.³ G01N *9/20*
U.S. Cl. 73—453 **11 Claims**



1. An electronic hydrometer comprising a housing having a liquid receiving chamber, means to insert a liquid of which the density is to be determined in said chamber, a float having a known weight being disposed in said chamber, a connecting shaft secured to said float and maintained axially aligned in said housing by spaced apart guide slots for guided displacement along its longitudinal axis in response to introduction of a predetermined quantity of liquid in said chamber, a sensor associated with said shaft for detecting a reference position of said shaft, a permanent magnet mounted in proximity of said shaft and having a magnetic core and a displaceable coil about said core, said coil being secured to said shaft, an electronic circuit means to automatically adjust the value of a current flowing in said coil to displace said coil and said shaft relative to said reference position, the value of said adjusted current being calibrated by said circuit to generate an output signal indicative of the density of said liquid in said chamber and a sinusoidal signal connected to said coil to impart to said shaft small oscillations whereby to prevent frictional retention of said shaft through said guide slots.

4,400,979

FORCE TRANSDUCER FLEXURE WITH CONDUCTORS ON SURFACES IN THE NEUTRAL BENDING PLANE

Richard A. Hanson, Woodinville, and Kim W. Atherton, Bellevue, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 14, 1981, Ser. No. 283,129
Int. Cl.³ G01P *15/13*
U.S. Cl. 73—517 B **14 Claims**

1. In a transducer having a mounting base and a force sensitive member having an electrical element, a flexure for securing the member to the mounting base, comprising:

at least one flexure section having a pair of faces and a pair of edge surfaces extending between said member and said mounting base;

at least one channel having a recessed surface extending into said section from one of said faces wherein at least one of said recessed surfaces is contiguous to one of said edge surfaces, said recessed surfaces being substantially aligned with the neutral bending axis of said flexure section; and

an electrically conductive material disposed on said recessed surface extending between said force sensitive member and said mounting base.

4,400,980

METHOD AND DEVICE FOR DETECTING CHANGES IN THE MECHANICAL STATE OF THE MEMBERS OF A STRUCTURE IMPLANTED IN THE SEA

Philippe R. Lepert, Marseille, France, assignor to Syminex [Societe Anonyme], Marseille, France

Filed Aug. 31, 1981, Ser. No. 297,913
Claims priority, application France, Sep. 12, 1980, 80 19883
Int. Cl.³ G01H *13/00*; G01M *7/00*
U.S. Cl. 73—579 **8 Claims**

1. A method for detecting changes in the mechanical state of the immersed members of a structure at sea which consists of the steps of:

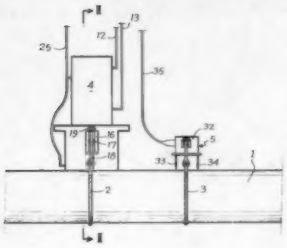
(a) exciting individually a point of each member by subjecting it to impacts;

(b) after each impact, measuring and recording to excitation signal;

(c) simultaneously measuring and recording the dynamic response signal in said excited point or in a point very close to said excited point;

(d) processing the simultaneous excitation and response signals to extract therefrom signals having the same frequencies and to define a ratio between simultaneous excitation and response signals having the same frequency, which ratio varies with the frequency and presents peaks

corresponding to the natural frequencies of resonance of said member;



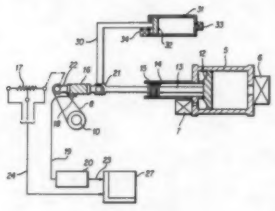
(e) and repeating said operations at time intervals and watching for any shifting of said resonance frequencies which indicates a change in the mechanical state of said member.

4,400,981

METHOD AND APPARATUS FOR DETECTING ABNORMAL CONDITIONS OF SWITCH GEARS

Akira Aoyagi; Kazuomi Sakata; Shinichi Ikeda, and Mashiro Koyama, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 28, 1981, Ser. No. 315,889
Claims priority, application Japan, Oct. 31, 1980, 55-153204
Int. Cl.³ G01D 9/38; G01L 5/22
U.S. Cl. 73—862.51 10 Claims



1. A method of detecting an abnormal condition of a switch gear device operated by means of an actuating device, comprising:

connecting a means for detecting force to a portion between the switch gear device and the actuating device;

driving a movable portion of the switch gear device by the actuating device;

concurrently detecting the driving force and providing an output from the detecting means indicative of the detected force;

recording the measured output from the detecting means; and

comparing the recorded detected output from the detecting means with a recorded output obtained in a normal operating state.

6. An apparatus for detecting an abnormal condition of a switch gear device including a movable contact contained in a sealed casing filled with insulating gas and driven by an actuating mechanism for actuating the movable contact with a predetermined drive force, said apparatus comprising:

a detecting unit mounted between the movable contact and the actuating mechanism for detecting and measuring drive force;

recording means coupled to said detecting unit for recording an output, indicative of drive force, of said detecting unit upon actuation of said switch gear by said actuating mechanism;

said recording means including means for reading out data at a slow speed; and

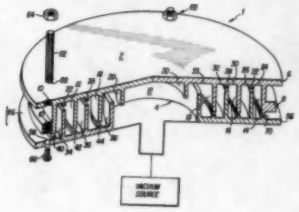
displaying means coupled to said recording means for displaying recorded data for analysis.

4,400,982

HIGH VOLUME PARTICLE COLLECTOR AND FRACTIONATOR

John P. Bell, Raleigh, N.C., assignor to The United States of America as represented by the Environmental Protection Agency, Washington, D.C.

Filed Aug. 10, 1981, Ser. No. 291,724
Int. Cl.³ G01N 1/24, 15/02
U.S. Cl. 73—863.22 10 Claims



1. A particle collector and fractionator, comprising:

(a) a bottom member having a plurality of concentric, annular channels;

(b) a top member having a plurality of concentric, annular channels which are complementary to said concentric, annular channels of said bottom member;

(c) adjustable fastening means threadedly engaged with said top member for securing said top and bottom members together in an interdigitated relationship so as to form a plurality of rectangular-shaped openings which define a gas flow path therebetween for receiving a particle laden gas;

(d) an inlet located radially outwardly of said rectangular-shaped gas flow path for receiving said particle laden gas;

(e) an outlet located radially inwardly of said rectangular-shaped gas flow path for withdrawing said particle laden gas;

whereby particles in a stream of said particle laden gas are collected in said channels defined by said interdigitated top and bottom members.

4,400,983

MECHANICAL BUNCHER FOR LEAFY VEGETABLES

Donald L. Peterson, Martinsburg, W. Va.; Ajit K. Srivastava, East Lansing, and Galen K. Brown, Okemos, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 88,673, Oct. 26, 1979, Pat. No. 4,275,649.
This application Apr. 28, 1981, Ser. No. 258,506
Int. Cl.³ F16H 21/36
U.S. Cl. 74—25 1 Claim

1. A rectangular motion generator comprising:

a. a driven crank having a crank pin;

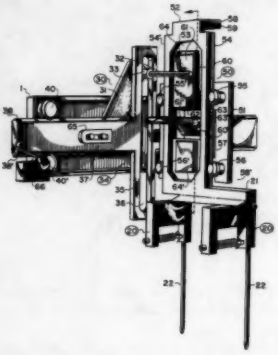
b. a Scotch-Yoke mechanism having a first arm adapted for reciprocal movement in a first directional line between opposed yoke guide bearings, and a slotted second arm in the same plane as and perpendicular to said first arm, wherein said second arm is journalled to the crank pin by means of a bearing engaged in the slot of said arm, whereby as the crank rotates, the Scotch-Yoke mechanism converts the rotational motion of the crank into reciprocal translation in said first directional line;

c. a frame member adapted for reciprocal movement in a second directional line between opposed frame member

guide bearings mounted on said yoke, wherein said second directional line is parallel to the plane of travel of the crank pin relative to the slotted arm, and wherein the frame member encloses an opening;

d. a bearing block mounted on said yoke opposite the opening in the frame member with respect to the crank pin and having ends positioned within the stroke of the crank pin in said second directional line; and

e. first and second flipper blocks each having a crank pin riding surface and an adjacent bearing block riding surface, wherein said flipper blocks are pivotally mounted within the opening of the frame member and are symmetrically oriented with respect to one another at a distance to accommo-



date the crank pin between the crank pin riding surfaces when the bearing block riding surfaces are both flush against the face of the bearing block, whereby as the crank pin acts against the crank pin riding surface of one of the flipper blocks, the bearing block riding surface of said one flipper block rides on the face of the bearing block thereby moving the frame member along the second directional line until said one flipper block reaches the end of the bearing block and pivots around said end, thereby permitting the crank pin but not the frame member to continue in said second directional line, and thereby securing the frame member from reversing direction until the crank pin reverses direction in said second directional line and clears the pivot point of said one flipper block.

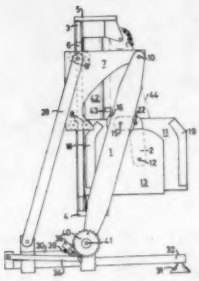
4,400,984

HANDLING MECHANISM FOR A RECTILINEAR MOVEMENT WITH CONNECTING PERPENDICULAR MOVEMENT SEGMENTS AT THE ENDS

Arne I. Rönbeck, Olofström, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Dec. 22, 1980, Ser. No. 218,748
Claims priority, application Sweden, Dec. 28, 1979, 7910725
Int. Cl.³ F16H *21/44*; B23Q *7/04*
U.S. Cl. 74—103 **14 Claims**

1. Handling mechanism for imparting to a working member a reciprocal, essentially rectilinear, relatively long first movement segment, and a relatively short second movement segment connecting to the end of and running perpendicular to said first movement segment, especially a feeding mechanism with a horizontal transport movement and a vertical raising or lowering movement at either end thereof, the working member being carried by a first end of an arm, the other end of which being guided to follow a first path of movement perpendicular to the first movement segment, the arm being driven by a reciprocally pivoting crank, the pivot axis of which intersects an extension of said first path of movement and said crank being pivotally joined via a crank pin to the arm at a pivot point located on said arm, so that during said first movement segment when the point moves along a circular arcuate path of movement, the square of the distance between the pivot point of the arm and the other end of the arm is essentially equal to the product of the distance between the pivot point of the arm and the first end of the arm and the distance between the pivot point of the arm and the axis of the crank, characterized in that



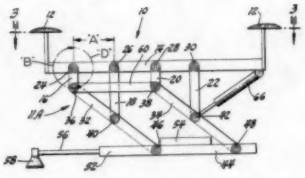
the crank pin is guided by guide means which during said second movement segment guide the pivot point of the arm along a second path of movement which is connected to the circular arcuate path and is rectilinearly parallel to the first movement path.

4,400,985

STRAIGHT LINE LINK MECHANISM

Irvin D. Bond, 10270 Allen Rd., Clarkston, Mich. 48016

Filed Apr. 22, 1981, Ser. No. 256,390
Int. Cl.³ F16H *21/04*
U.S. Cl. 74—103 **15 Claims**



1. A straight line link mechanism, comprising:

a support;

a first link;

first pivot means connecting the first link to the support for pivotal motion;

a second link;

second pivot means connecting the second link to the support for pivotal motion, the second pivot means being disposed a first distance from the first pivot means;

a third link;

third pivot means connecting the third link to the first link for relative pivotal motion a distance from the first pivot means of about one half said first distance;

fourth pivot means connecting the third link for relative pivotal motion to the second link a distance from said second pivot means of about 1.25 times said first distance;

said fourth pivot means being connected to the third link a distance from the third pivot means of about 1.25 times said first distance;

a controlled member, and means pivotally connecting the controlled member to the third link a distance of about 1.25 times said first distance from the fourth pivot means;

a forth link;

fifth pivot means connecting the fourth link to the support for pivotal motion, the fifth pivot means being disposed said first distance from the second pivot means;

a fifth link;

sixth pivot means connecting the fifth link to the support for relative pivotal motion, the sixth pivot means being disposed said first distance from the fifth pivot means;

a sixth link;

seventh pivot means connecting the sixth link to the fourth link a distance from the fifth pivot means of about one half said first distance such that the sixth link is movable in parallel relationship with the third link;

eighth pivot means connecting the sixth link for relative pivotal motion to the fifth link a distance of about 1.25 times said first distance from said sixth pivot means, said eighth pivot means being connected to the sixth link a distance of about 1.25 times said first distance from the seventh pivot means such that the eighth link is movable in parallel motion with the third link;

means pivotally connecting the sixth link to the control member a distance of about 1.25 times said first distance from the eighth pivot means; and

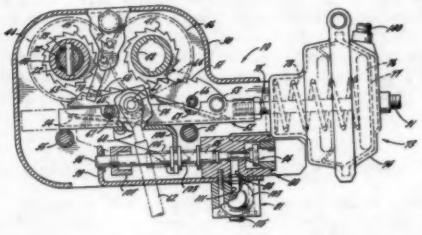
power means connected to one of said links such that as the first link is moved in a pivotal motion with respect to the support, the controlled member is moved along a substantially linear path of motion.

4,400,986

LANDING GEAR ACTUATOR

David L. Swanson, Rockford, and Dale E. Lyons, Belvidere, both of Ill., assignors to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jan. 22, 1981, Ser. No. 227,244
Int. Cl.³ F16H *27/02, 55/26;* B60R *27/00*
U.S. Cl. 74—128 **6 Claims**



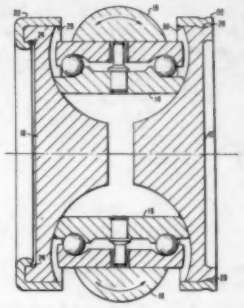
1. An actuator for a landing gear assembly having an extendible and retractable foot and having a rotatable member which extends or retracts the foot in dependence upon the direction of rotation of the rotatable member, said actuator comprising first and second rotatable gears disposed in meshing engagement with one another, one of said gears being adapted for connection to said rotatable member to rotate the latter, first and second one-way ratchet wheels rotatable with said first and second gears, respectively, and having teeth which face in the same direction, first and second pawls associated with said first and second ratchet wheels, respectively, a drive member, means for reciprocating said drive member back and forth through advance and return strokes, said first and second pawls being mounted on said drive member to reciprocate back and forth with the drive member and to move relative to the drive member between active and inactive positions with respect to said first and second ratchet wheels, respectively, each of said pawls being operable to turn its respective ratchet wheel but only when the pawl is in its active position and said drive member is shifted through its advance stroke, and selectively operable means movable between a first position causing said first and second pawls to shift to their active and inactive positions, respectively, and a second position causing said first and second pawls to shift to their inactive and active positions, respectively.

4,400,987

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

James H. Kraus, Huntington Beach, Calif., assignor to Excelermatic Inc., Austin, Tex.

Filed Dec. 22, 1980, Ser. No. 218,643
Int. Cl.³ F16H *15/40*
U.S. Cl. 74—200 **3 Claims**



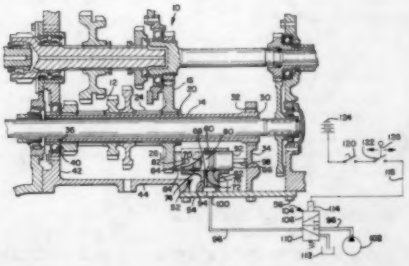
1. An infinitely variable traction roller transmission comprising coaxial input and output toric discs rotatably supported opposite each other and defining a toric space therebetween; at least two motion transmitting traction rollers disposed in the toric space between said toric discs; said traction rollers and toric discs being in engagement with each other for the transmission of motion, and a pivotal support structure supporting said traction rollers so as to permit pivoting of said traction rollers between two pivotal end positions for changing the transmission ratio, said toric discs having separate guide flanges of hardened steel mounted thereon at their circumference, said guide flanges projecting axially toward each other so as to form rims at the circumference of said toric discs for guiding the traction rollers in the pivotal end positions.

4,400,988

SINGLE GEAR OPPOSED REACTION TRANSMISSION BRAKE

Jon R. Hagarty, Darien, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Jul. 30, 1981, Ser. No. 288,703
Int. Cl.³ F16H *57/10, 3/38*
U.S. Cl. 74—411.5 **5 Claims**



1. In a transmission having a housing containing a rotatable shaft to which a constant mesh gear is mounted, a source of fluid pressure, a transmission access plate having a fluid access port, an opposed reaction brake mounted to an interior surface of said transmission access plate adjacent said constant mesh gear;

said opposed reaction brake comprising:

a pedestal portion for supporting said brake on said interior surface of said transmission access plate;

a longitudinal piston bore supported on said pedestal, said longitudinal piston bore being an open ended cylinder and having a hydraulic fluid access port in a central portion thereof;

first and second pistons, having seal ends, carried seal end-to-seal end in said longitudinal piston bore, a first of said pistons provided with a face portion for contacting said constant mesh gear when said opposed reaction brake is actuated, said second of said pistons having spacer means for contacting said transmission housing.

4,400,989

LUBRICATION MECHANISM IN CHANGE-SPEED GEARING UNIT

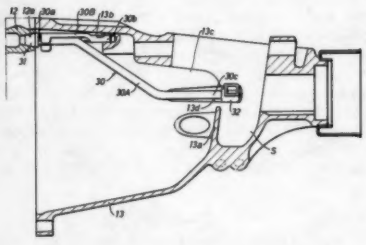
Kazuhito Ikemoto; Nobuaki Katayama; Yukio Terakura, all of Toyota, and Kan Sasaki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 28, 1981, Ser. No. 287,817

Claims priority, application Japan, Aug. 20, 1980, 55-117923

Int. Cl.³ F16H *57/04*; F01M *9/00*

U.S. Cl. 74—467 **5 Claims**



1. A lubrication mechanism in a change-speed gearing unit in which an output shaft extends in an axial direction through the interior of a housing assembly including an extension housing secured at its front end to a transmission casing, said extension housing being formed therein with an oil well which is located at the rear bottom portion of said extension housing to lubricate the support portion of said output shaft, the lubrication mechanism comprising:

a longitudinal oil transfer trough extending in a fore-and-aft direction at one side of the inner wall of said extension housing, said trough being fixed at its front end to the upper portion of said housing assembly in such a way as to open toward the upper interior space of said transmission casing and being fixed at its rear end to the rear portion of the side wall of said extension housing in such a way as to open toward the interior space of said extension housing; and

a hollow bush of elastic material formed with a closed tubular portion coupled over the rear end of said trough and integrally formed with an outlet portion laterally extending from said tubular portion and opening toward the interior space of said extension housing, said hollow bush being pressedly mounted within an axial groove formed in the rear portion of the side wall of said extension housing above said oil well in such a manner that the rear end of said trough is in open communication with the outlet portion of said bush.

4,400,990

STEERING COLUMN ASSEMBLY

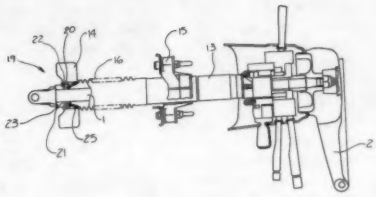
Ronald A. Cook, Hockley, and Derek W. Strutt, Chelmsford, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 19, 1981, Ser. No. 226,276

Claims priority, application United Kingdom, Feb. 29, 1980, 8007027

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—492 **14 Claims**



1. A steering column assembly comprising an axially-extending upper shaft part adapted at its upper end for connection to a steering wheel and adapted at its lower end for connection to a second shaft part; a jacket surrounding the upper shaft part along at least part of its length; a mounting bracket secured to the jacket for connecting the jacket to the body of a vehicle and a bearing in the lower part of the jacket for allowing the upper shaft part to rotate in the jacket and for preventing the upper shaft part from moving radially relative to the jacket, the jacket including an energy-absorbing element which undergoes axial deformation when an impact load is applied to the upper shaft part sufficient to move the upper shaft part downwardly relative to the mounting bracket, characterized in that the bearing is disengagable from the jacket during the downward movement of the upper shaft part to allow the upper shaft part to move radially relative to the jacket.

4,400,991

RACK AND PINION STEERING GEAR, ESPECIALLY FOR MOTOR VEHICLES

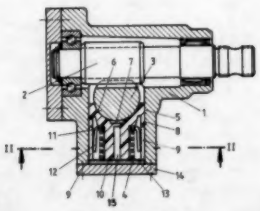
Werner Breitweg, and Wolfgang Walter, both of Schwabisch Gmund, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,085

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928732

Int. Cl.³ B62D *3/12*

U.S. Cl. 74—498 **2 Claims**



1. In a rack steering gear having a steering-gear housing (**1**), a drive pinion (**2**), a spindle connected to the drive pinion, an axially displaceable rack (**3**) engaged with the drive pinion and arranged transversely to the spindle, and plastic thrust means (**5, 25**) mounted resiliently in the steering-gear housing for supporting and guiding said rack, and a spring (**4**) biasing the

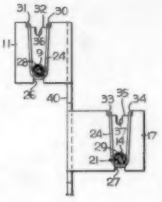
thrust means, the improvement including a cylindrical, thin-walled quide portion (**8, 28**) on the thrust means provided with axially running slots; a spreader element (**11, 21**) acting on the thin-walled quide portion disposed within the thrust means; the thrust means further including an upright portion (**10**) supported in the housing and a rack supporting bed (**6**) integral with the upright portion, the upright portion being a hollow cylinder arranged within the spring (**4**).

4,400,992

CABLE RETAINER CLIP

Manuel P. Londres, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 29, 1980, Ser. No. 192,078
Int. Cl.³ F16C *1/10*
U.S. Cl. 74—501 R **10 Claims**



1. A cable retainer assembly comprising, a support member defining a cable slot, a sheathed cable having a sheath with an annular recess formed on the sheath received in the cable slot to axially lock the cable, a retainer clip extending around the cable retaining said cable in the cable slot, a retainer clip slot on the opposing side of said support member from said cable slot, a notch formed in said retainer clip slot to receive retainer clip ends for assembly of said retainer clip and thereby allow said retainer clip ends to expand against the sides of said retainer slot in the assembled position for locking said cable in the support member.

4,400,993

MECHANISM FOR ABSORBING ELONGATION OF A WIRE

Tetuo Kobayashi, Ikeda, and Syoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System, Inc., Hyogo, Japan

Filed Jun. 24, 1981, Ser. No. 276,802
Claims priority, application Japan, Feb. 12, 1981, 56-19972
Int. Cl.³ F16C *1/10*
U.S. Cl. 74—501.5 R **2 Claims**

1. A mechanism for absorbing elongation of a wire comprising

a ratchet pulley having a first ratchet teeth over all a circumference of one side surface, a shaft rotatably supported to a casing being inserted into and engaged with said ratchet pulley, and one end portion of the wire being wound around said ratchet pulley;

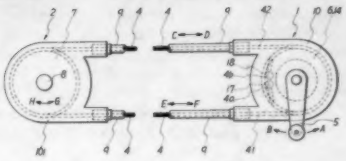
a ratchet roller being adjacent to said ratchet pulley, being rotatably supported to the shaft and axially movable, having a second ratchet teeh capable of engaging with said first ratchet teeth, and having a clutch spring-engaging groove at the other side surface;

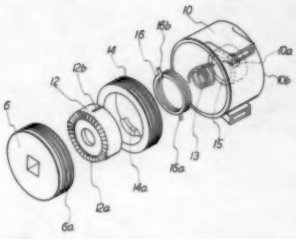
a tubular winding pulley for the wire being rotatbly arranged to an outer surface of said ratchet roller, and having an adjusting projection shaped as a fan and projected radially inward at one end surface;

a spring member urging said ratchet roller to the ratchet pulley side;

a clutch spring for regulating the rotation of said ratchet roller; and

a tubular clutch bos axially projected from a bottom of said casing in order to coil said clutch spring,





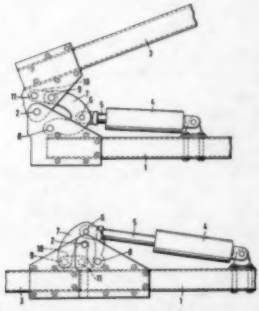
whereby elongation of the wire wound up or off by said pulleys is automatically absorbed.

4,400,994

HINGE ASSEMBLY

Magne Skjaeveland, Klepp st., Norway, assignor to Kverneland A/S, Kvernaland, Norway

Filed Dec. 30, 1981, Ser. No. 335,834
Claims priority, application Norway, Feb. 11, 1981, 810457
Int. Cl.³ G05G *1/04*
U.S. Cl. 74—520 **3 Claims**



1. A hinge assembly for use with extendable implements and the comprising:

(a) a fixed segment,

(b) a pivotal segment,

(c) first link means pivotally connecting said fixed segment to said pivotal segment,

(d) extending means mounted on said fixed segment,

(e) a substantially U-shaped member having two legs and a bight portion,

(f) second linking means pivotally connecting said bight portion to said extending means,

(g) third linking means pivotally connecting one leg of said substantially U-shaped member to said fixed segment,

(h) a coupling member having first and second ends,

(i) fourth linking means pivotally connecting the other leg of

said substantially U-shaped member to said first end of said coupling member,

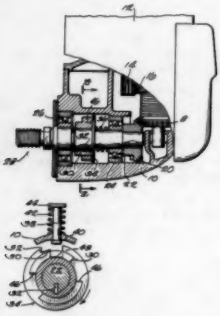
(j) Fifth linking means connecting said second end of said coupling member to said pivotalsegment; whereby when said pivotal segment is extended in line with said fixed segment, said second end of said coupling means is aligned intermediate to the legs of said substantially U-shaped member, and said first linking means is aligned substantially intermediate said bight portion of said substantially U-shaped member and said second end of said coupling means.

4,400,995

SPINDLE LOCK WITH IMPACTING CAPABILITY

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Sep. 23, 1981, Ser. No. 304,852
Int. Cl.³ G05G 5/06; B24B 23/00
U.S. Cl. 74—527 12 Claims



1. A power tool comprisng,

a housing,

a spindle journaled in the housing,

a spindle lock member rotating with the spindle inside the housing,

a recess in the perimeter of the lock member having substantial angular embrace,

a lock pin reciprocably mounted in the housing for movement between an inactive position and an operative position in which it projects into said recess, means biasing the lock pin to its inactive position,

blocking means coaxial with the spindle and extending radially beyond the lock member into the path of movement of the lock pin to prevent movement of the lock pin to its operative position,

means biasing the blocking means into frictional engagement with the lock member so it normally rotates with the lock member but may be restrained from such rotation,

said blocking means having an opening therein permitting passage of the lock pin therethrough when the lock pin is aligned with the opening but precluding entry of the lock pin when the blocking means is rotating at high speed,

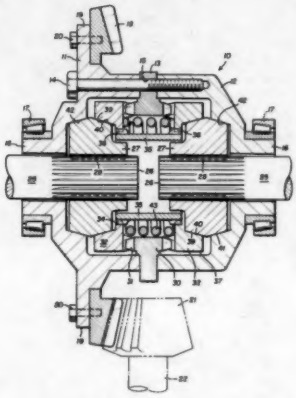
a major dimension of the cross-section of said lock pin being substantially less than the angular embrace of said recess whereby said spindle is capable of substantial angular movement relative to the lock pin when the lock pin is in its operative position to permit impacting the ends of the recess against the lock pin.

4,400,996

POSITIVE CLUTCH DIFFERENTIAL

Carl E. Schou, 1438 Lone Pine Rd., Bloomfield Hills, Mich. 48013

Continuation of Ser. No. 127,219, Mar. 4, 1980, abandoned. This application Sep. 29, 1981, Ser. No. 306,833
Int. Cl.³ F16H 35/04
U.S. Cl. 74—650 4 Claims



1. In a differential assembly for rotatably driving a pair of axially aligned axle-like shafts and having a housing within which adjacent end portions of the two shafts extend, with said housing being rotatable about an axis aligned with the axes of said shafts, an improved means arranged within the housing for releasably interconnecting the shaft ends to the housing for thereby rotating the shafts, comprising:

a center driving ring axially aligned with and connected to the housing for rotation therewith;

a pair of annular pressure rings, each axially aligned with said arranged adjacent one end of the center driving ring, with the pressure rings each being axially movable a short distance towards and away from the center driving ring, said pressure rings and center driving ring having adjacent facing portions;

interengaging, generally v-shaped, wedge-like teeth integrally formed on the adjacent facing portions of the center driving ring and each of the pressure rings, with said adjacent interengaging wedge-like teeth being loosely meshed so that rotation of the center driving ring causes the pressure ring teeth to engage with and wedge axially outwardly of the center driving ring teeth, but with rotation of either of the pressure rings at a speed in excess of the center ring speed, resulting in the pressure ring teeth gapping away from contact with their respective adjacent center driving ring teeth, so that the wedging action is released, wherein the pressure ring may move axially in a direction towards the center driving ring;

a stop ring extending within and being coaxial with the center driving ring and through an axially aligned opening formed in each of the annular pressure rings, said stop ring having gear-like teeth formed upon its opposite outer peripheral edge portions, and meshing with corresponding inner gear-like teeth formed on the periphery edge portion defining the opening formed in each adjacent pressure ring, with said stop ring and inner pressure ring teeth being loosely interfitted for limited relative rotational movement of the stop ring and each pressure ring, before engagement of their respective teeth;

and with the spacing between adjacent inner pressure ring teeth and stop ring teeth being formed so that such adjacent teeth will engage when the center ring wedge-like teeth and adjacent pressure ring wedge-like teeth are

gapped apart to thereby roughly center the gapped apart teeth from each other and prevent the opposite tooth surfaces of the gapped apart teeth from engaging each other;

a relasable clutch means for inter-engaging each pressure ring with its respective adjacent axle end when the respective pressure ring is wedged in a direction outwardly of the center pressure ring during engagement of the respective teeth and for releasing the pressure ring from its adjacent axle end when the respective teeth are gapped apart;

a spring extending between and pressing apart the two pressure rings for resiliently urging the pressure rings into engagement with their respective clutch means;

whereby normal rotation of the center driving ring, with the housing, rotates both pressure rings and the axle shafts through the respective clutch means, but during any overspeed of either axle, relative to the housing rotation, the meshing wedge-like teeth of its respective pressure ring gaps relative to the corresponding wedge-like teeth of the center driving ring so that the pressure ring moves axially towards the center driving ring for thereby releasing its clutch connection to its axle so that its axle is free to rotate independently of the housing.

4,400,997

DRIVE FOR A VEHICLE WITH AN INTERNAL COMBUSTION ENGINE AND AN ELECTRIC MOTOR

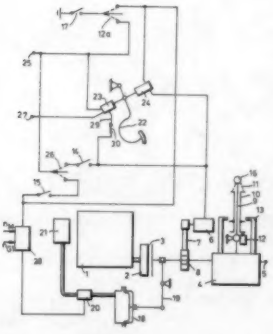
Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 23, 1980, Ser. No. 199,999

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943519

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—661 **15 Claims**



1. In a vehicle having a drive train including an accelerator lever and an internal combustion engine, a clutch, a manual transmission and an electric motor connected to said transmission, said transmission having a shift lever, a shift gate, a shift lane associated with the lowest gear of said transmission, and a transmission input shaft, apparatus for controlling operation of said drive train, comprising:

a control lever supported by said shift lever and longitudinally displaceable against a spring when said shift lever is in a neutral position, said control lever having means for retaining said control lever in the displaced position by engaging said shift gate when said shift lever is positioned out of said neutral position;

a first switch in said transmission actuated by said control lever;

a first motor circuit including means coupled to said accelerator lever for controlling the speed of said electric motor;

a second motor circuit including means coupled to said accelerator lever for controlling the speed of said engine;

a first clutch circuit for disengaging said clutch;

a second clutch circuit including a second switch for disengaging said clutch when said shift lever is grasped;

said first switch selecting said first clutch circuit and said first motor circuit when said control lever is longitudinally displaced, and selecting said second motor circuit and said second clutch circuit when said control lever is not longitudinally displaced.

4,400,998

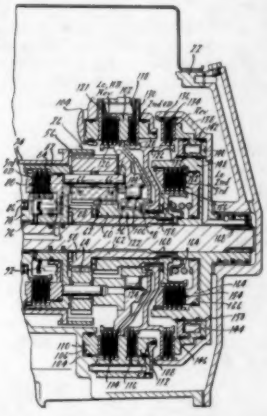
FOUR SPEED OVERDRIVE TRANSAXLE

Charles C. Bookout, Orchard Lake; John P. Heeney, Bloomfield Hills, and Richard E. Murphy, Inkster, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 12, 1980, Ser. No. 149,060

Int. Cl.³ F16H *37/08, 47/08, 57/10*

U.S. Cl. 74—740 **4 Claims**



1. A transaxle driveline comprising a hydrokinetic torque converter and multiple ratio planetary gearing;

said converter having a turbine and an impeller adapted to be connected drivably to a vehicle engine crankshaft, the axes of the crankshaft, the converter and the gearing being common;

said gearing comprising a ring gear, a large sun gear, a small sun gear, the large sun gear being located on the side of said small sun gear remote from said engine crankshaft, a set of long planet pinions engaging said large sun gear and said ring gear, a set of short planet pinions engaging said small sun gear and the long planet pinions, a carrier for journalling said long and short pinions;

first brake means for anchoring said carrier during operation in first forward drive ratio and in reverse drive, second brake means for anchoring said large sun gear during second underdrive ratio and during overdrive operation;

a turbine shaft connected to said turbine and extending through said planetary gearing to the side of said planetary gearing remote from said crankshaft;

first clutch means for connecting said turbine shaft to the small sun gear during operation in the first and second underdrive ratios and during direct drive operation, second clutch means for connecting said turbine shaft to said carrier during direct drive operation and overdrive operation, third clutch means for connecting said large sun gear to said turbine shaft during reverse drive operation;

said first clutch means and said third clutch means having a

common cylinder member with annular cylinders located in radial disposition, one with respect to the other, the third clutch means having a larger operating radius then the first clutch means;

said first and third clutch means being located on the side of said planetary gearing remote from said crankshaft;

said first and second brake means being located radially outward of said planetary gearing and on the side of said first and third clutch means closest to said crankshaft;

and final drive gearing including a differential gear mechanism with an operating output axis spaced from the axis of said final drive gearing, the operating plane of said final drive gearing being located between said converter and said planetary gearing;

said second clutch means being located between said carrier and said final drive gearing and comprising an annular cylinder forming part of said carrier and journalled about said turbine shaft, an annular piston in said cylinder, a clutch element secured to said turbine shaft, first and second clutch discs secured to said annular cylinder and to said clutch element, respectively, said annular piston and said annular cylinder defining a working pressure chamber which, when pressurized, causes said discs to frictionally engage;

a bearing support wall between said impeller and said final drive gearing for journalling the latter, said ring gear encircling said clutch discs and being connected to a torque input gear of said final drive gearing.

4,400,999

DRIVE HUB FOR BICYCLES OR THE LIKE

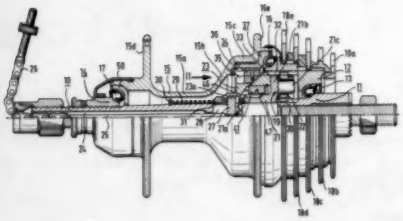
Werner Steuer, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,810

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940841

Int. Cl.³ F16H *3/44*

U.S. Cl. 74—781 B **17 Claims**



1. Drive hub for bicycles comprising an axially extending hub shaft having an axis, an outer diameter, a first end and a second end, a driver supported on said hub shaft adjacent the first end thereof, a plurality of sprockets on said driver, said plurality of sprockets extending over a predetermined axial extent, a hub sleeve laterally enclosing said hub shaft and supported on said hub shaft closer to the second end thereof and supported on said driver closer to the first end of said hub shaft, a planetary gear system encircling said hub shaft and enclosed by said hub sleeve and driver, said planetary gear system arranged to transmit driving force from said driver to said hub sleeve and comprising a sun gear fixed to said hub shaft, a planet gear carrier rotatably mounted about said hub shaft, an annular gear with internal gear teeth of predetermined axial length being spaced radially outwardly from and rotatable around said hub shaft, and at least one planet gear mounted on said planet gear carrier for engagement with said sun gear and with said internal gear teeth on said annular gear, means for selectively coupling said hub sleeve with one of said annular gear and said planet gear carrier, means for shifting said coupling means, said shifting means including transmission means, said hub shaft having a bore therein extending from one of said ends toward the other of said ends with said transmission means extending through said bore, and wherein the improvement comprises that said annular gear is fixed to said driver, said coupling means comprises a carrier ring arranged to be selectively coupled for common rotation with one of said driver and said planet gear carrier, at least one first pawl being positioned on said carrier ring, first inner ratchet teeth formed on said hub sleeve, said first pawl being engaged with said first inner ratchet teeth.

4,401,000

TONG ASSEMBLY

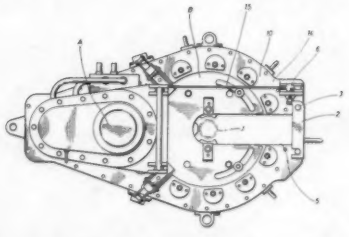
Robert B. Kinzbach, Houston, Tex., assignor to Weatherford/Lamb, Inc., Houston, Tex.

Continuation of Ser. No. 145,905, May 2, 1980, Pat. No. 4,346,629. This application Apr. 5, 1982, Ser. No. 365,697

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.2 **15 Claims**



1. A tong assembly for rotating a tubular member comprising,

a housing, having a housing slot for receiving the tubular member,

a carrier rotatably supported from the housing, the carrier having a carrier slot for receiving the tubular member,

at least one freely pivotable jaw for engaging and rotating the tubular member, each jaw having jaw coaction means connected thereto,

an individual link for each jaw freely pivotably connected to each jaw and freely pivotably connected to the carrier element,

a drag means connected to the carrier element and coacting with each jaw for moving each jaw relative to the tubular member, the drag means having a drag means slot for receiving the tubular member, and the drag means having drag coaction means for coacting with each jaw coaction means for maintaining the symmetry of the jaws about the tubular member when there is more than one jaw and for limiting the movement of each jaw to substantially radial movement along the center line of the tubular member, and

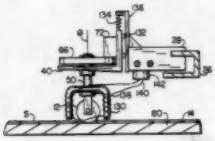
a brake means for engaging the drag plate and actuating each jaw.

4,401,001

APPARATUS FOR CUTTING SHEET MATERIAL WITH A CUTTING WHEEL

Heinz J. Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., South Windsor, Conn.

Division of Ser. No. 168,312, Jul. 10, 1980, Pat. No. 4,373,412. This application Dec. 8, 1981, Ser. No. 328,786
Int. Cl.³ D06H 7/00
U.S. Cl. 83—451 6 Claims



1. An automatically controlled cutting machine for cutting sheet material in limited plies and thicknesses comprising:

a cutting table having a hard support surface on which sheet material is laid for cutting;

a cutting wheel having a sharp peripheral cutting edge which rolls over the support surface of the table to cut the sheet material spread thereon;

suspension means above the support surface of the table and supporting the cutting wheel for movement in rolling fashion along predetermined lines of cut through the sheet material on the support surface;

drive means connected with the suspension means, the cutting wheel and the cutting table for controllably advancing the cutting wheel along lines of cut through the material on table; and

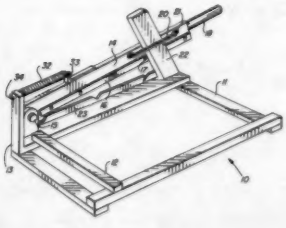
controlled magnetic means associated with the wheel and the table for pulling the cutting edge of the wheel and the hard support surface toward one another at a high force level to cause the cutting edge of the wheel to sever the sheet material without reacting the high force level through the suspension means to the table.

4,401,002

SOFFIT CUTTING MECHANISM

Victor H. Worsham, P.O. Box 1318, Crystal River, Fla. 32629

Continuation of Ser. No. 91,588, Nov. 5, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 346,420
Int. Cl.³ B23D 17/08
U.S. Cl. 83—467 R 3 Claims



1. A soffit cutting mechanism comprising in combination:

a base;

a hinged cutting bar swingably attached to said base;

a blade attached to said hinged cutting bar to swing therewith;

blade guide means having a guide track attached to said base for supporting said hinged cutting bar and blade while cutting with said blade and a guide bracket attached to said hinged cutting bar and supporting said hinged cutting bar and attached blade to said guide track, said blade guide means guide bracket being attached to one side of said hinged cutting bar to fit over said guide track to hold said hinged cutting bar and blade guide track adjacent said guide track hinged cutting bar and blade;

a fixed profile blade attached to said base and positioned to support shaped material thereon and co-acting with said hinged blade to cut off a length of said shaped material, said profile blade having a predetermined profile shape to receive and support said predetermined shaped material during cutting, said profile blade being a generally straight blade member having a generally V-shaped notch in the middle portion thereof and a removed portion on either end portion of said straight blade member adapted to receive aluminum soffit material supported across its profile on one side by said profile blade;

aligning means for aligning shaped material on said base in said profile blade said aligning means including a square guide mounted perpendicular to said hinged blade and to said profile blade, whereby swinging said hinged blade across said profile blade will shear an elongated shaped material positioned thereon;

a hinged blade support bracket attached to said base for holding said hinged blade cutting bar; and

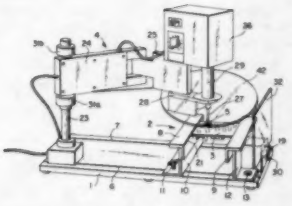
a spring connected between said hinged blade support bracket and said hinged blade hinge cutting bar to bias said blade to an open position.

4,401,003

LEAD TRIMMER FOR PRINTED CIRCUIT BOARDS

Wilbur A. Baldwin, Centerport, N.Y.; Richard Silverman, Clark, N.J.; Leigh Jezorek, Hillsboro, N.J., and Irving Pitel, Edison, N.J., assignors to Roto Form Sales Corp., Lake Grove, N.Y.

Filed Sep. 3, 1981, Ser. No. 299,056
Int. Cl.³ B26D 1/16, 7/01
U.S. Cl. 83—483 5 Claims

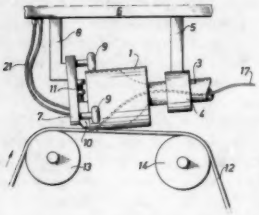


1. An apparatus for trimming the wire leads of electronic components soldered on printed circuit boards, comprising a base plate; an adjustable holding fixture for receiving a printed circuit board mounted on the base plate; a cantilevered bracket assembly pivotally mounted on the base plate; a motor driven rotary cutting blade disposed on the end of the cantilevered bracket assembly for movement in a plane parallel to and adjacent to the surface of a printed circuit board disposed in the holding fixture to trim the wire leads thereon without damaging the board, and an anti-warp device for straightening a printed circuit board disposed in the holding fixture, including a pair of pivotable lever arms disposed above and below the holding fixture and a pin mounted on each pivotable lever arm to contact the top and bottom surfaces, respectively, of the printed circuit board to urge the same into a straightened position.

4,401,004
ARRANGEMENT TO REDUCE THE THICKNESS OF A MOVING MATERIAL WEB

Jan-Erik Glans, Kävlinge, and Arvid Martensson, Södra Sandby, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Jan. 29, 1981, Ser. No. 230,045
Claims priority, application Sweden, Feb. 5, 1980, 8000890
Int. Cl.³ B26D *3/06*
U.S. Cl. 83—875 **11 Claims**



1. Apparatus for reducing the thickness of a moving material web comprising:

rotating cylindrical cutting means for cutting a strip from the material web, said cutting means having a circular cutting edge;

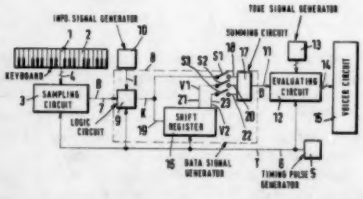
guide means for controlling the thickness of said strip; and

support means for supporting said cutting means adjacent said cutting edge, said guide means being mounted on said support means and said guide means having a working surface adjacent said cutting edge, whereby both the cylindrical cutting means and the guide means being supported on the support means assure a substantially constant distance between said cutting edge and said working surface.

4,401,005
ELECTRONIC KEYBOARD-OPERATED MUSICAL INSTRUMENT

Reinhard Franz, Tulpenstrasse 15, D-5401 Emmelshausen, Fed. Rep. of Germany, and Wilfried Dittmar, Halsenbach, Fed. Rep. of Germany, assignors to Reinhard Franz, Emmelshausen, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,385
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104312
Int. Cl.³ G10H *1/20, 5/10*
U.S. Cl. 84—1.01 **15 Claims**

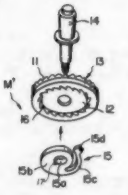


1. In an electronic keyboard-operated musical instrument, the combination of at least one keyboard having a plurality of keys which are actuatable to initiate the generation of pulses; a sampling circuit arranged to cyclically scan said keyboard and to generate a series of key identification signals each constituting a series of pulses wherein the positions of the pulses are indicative of the actuated keys; a tone signal evaluating circuit; a source of information signals; and a data signal generator circuit having first and second inputs respectively connected with said sampling circuit and said source, and an output connected with said evaluating circuit, said generator circuit comprising means for appending each information signal to a key identification signal so as to generate a succession of combination signals, a time delay device having input means for reception of said combination signals and at least one input means for delayed partial transmission of combination signals to the output of said generator circuit, and means for blocking the transmission to said device of that portion of each combination signal which constitutes the respective information signal.

4,401,006
MUSIC BOX SPRING WINDING MECHANISM

Takeshi Sekiguchi, No. 3-101, Takahama-cho, Takahagi-City, Ibaragi-ken, Japan

Filed Aug. 5, 1981, Ser. No. 290,115
Int. Cl.³ G10F *1/06*
U.S. Cl. 84—95 R **3 Claims**



1. A music box spring drive mechanism comprising: a wheel including a lower surface and an upper surface, a recess having an inner peripheral wall found in said lower surface, said recess having ratchet teeth formed along the inner peripheral wall, said upper surface including a peripheral edge having a bevel gear formed therealong;

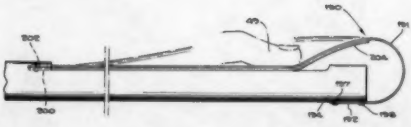
a spring winding axle having one end of a spring connected thereto, the other end of said spring being connected to a fixed portion of said music box; and

a pawl member located within said pawl member having a body portion connection to said axle rotation therewith, a resilient arcuate pawl portion formed integrally with said body portion, said pawl portion having teeth means thereon for engagement with said ratchet teeth.

4,401,007
WIND INSTRUMENT

Jeffrey J. Lewis, 334 Sunset Ave., Venice, Calif. 90291

Continuation of Ser. No. 251,838, Apr. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 106,646, Dec. 26, 1979, Pat. No. 4,320,686, which is a continuation of Ser. No. 926,459, Jul. 20, 1978, abandoned. This application Aug. 23, 1982, Ser. No. 409,810
Int. Cl.³ G10D *9/04*
U.S. Cl. 84—380 R **5 Claims**



1. In a wind instrument, the provision of:

mouthpiece means for producing a sound;

tubular means forming an elongated resonating chamber operatively associated at one end with the mouthpiece means, the effective length of the chamber serving to

control the pitch of a musical note produced by the instrument;

means selectively actuable by the user for continuously varying the effective length of the chamber including an elongated slot extending substantially the length of the chamber; and

closure means digitally operable by the user for closing the slot from its end adjacent to the mouthpiece means to a selected point spaced toward the other end of the slot, the closure means, when in closed position, lying wholly outside an imaginary circle including a continuation across the slot of the interior surface of the tube,

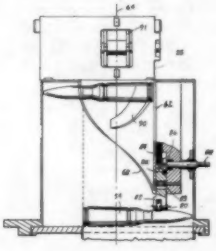
said closure means including a longitudinally extending closure strip assembly of flexible but stiff sheet material, upwardly convex as viewed in transverse section, having one end fixed to the tubular means adjacent to the mouthpiece, and including means for resiliently supporting the distal end of the strip spaced above the outer end of the slot, said assembly including a layer of resilient sealing material bonded to the lower surface of said sheet material.

4,401,008

AMMUNITION HANDLING SYSTEM

George L. Walker, Jr., Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Aug. 17, 1981, Ser. No. 293,817
Int. Cl.³ F41D *10/14*
U.S. Cl. 89—33 BB **2 Claims**



1. An armament system comprising:

a gun adapted to rotate in train about an axis,

means which is stationary in train for supplying ammunition;

orientation means, disposed between said gun and said ammunition supply means, and adapted to rotate in train as a function of the rotation in train of said gun;

a train of rounds carriers passing from said supply means, through said orientation means, to said gun,

each carrier coupled to the next adjacent carrier by a pivot means capable of unrestricted rotation, and each carrier carrying a respective round of ammunition;

said orientation means intercepting and orienting each assembly of carrier and respective round by rotation of its respective pivot means to an orientation in train which is determined by the orientation in train of said gun;

said orientation means including:

support means disposed for rotation about said axis and having a cutout therein for passing therethrough a carrier with a respective round of ammunition,

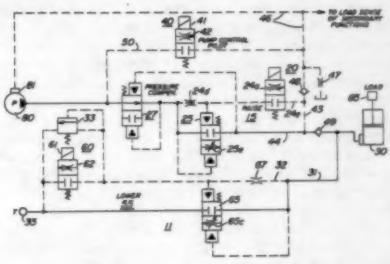
a hollow cylinder fixed to said support means and coaxial with said axis, and having a distal end portion cut along a substantially diagonal plane to form a symmetrical, single nose cam surface having a high portion which is 180° out of phase with said cutout and a low portion which is in phase with said cutout, whereby said cam surface intercepts the projectile of each round as it passed through said orientation means, except a round which is in phase with said cutout, and cams said intercepted round and its respective carrier about its respective pivot means into an orientation whereat they are in phase with said cutout.

4,401,009

CLOSED CENTER PROGRAMMED VALVE SYSTEM WITH LOAD SENSE

Kenneth W. Zeuner, New Hope, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Continuation of Ser. No. 34,778, Apr. 30, 1979, Pat. No. 4,276,811, which is a continuation-in-part of Ser. No. 578,006, May, 1975, Pat. No. 3,980,002, Ser. No. 723,023, Sep. 13, 1976, Ser. No. 842,264, Oct. 14, 1977, Pat. No. 4,276,810, said Ser. No. 578,006, is a continuation of Ser. No. 304,816, Nov. 8, 1972, abandoned, said Ser. No. 723,023, and Ser. No. 842,264, each is a continuation-in-part of Ser. No. 578,006,. This application Jun. 1, 1981, Ser. No. 268,808
Int. Cl.³ F15B *13/043*
U.S. Cl. 91—28 **4 Claims**



1. A valve system having a load sense line coupled through a first one way directional means to a load sense fluid source for control of the positioning of load means by a pair of valve assemblies comprising

(a) a first of said valve assemblies having a solenoid operated pilot first stage, a second stage divided into inlet and outlet sections with the inlet section being coupled to the fluid source, and a second stage orifice between the sections,

(b) a second of said valve assemblies having a solenoid operated pilot first stage, a second stage being fluidly coupled to said pilot first stage and divided into inlet and outlet sections, a second stage orifice between the sections and the second stage inlet section being fluidly coupled to the load means, and

(c) said first valve assembly including

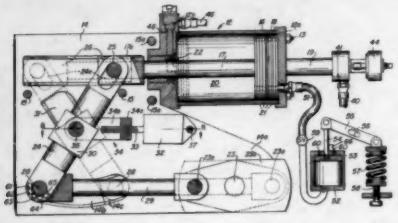
(i) said pilot first stage being fluidly coupled to said second stage for normally maintaining said second stage closed, and

(ii) coupling means free of a separate actuated valve for (A) directly coupling said load sense line to said first valve assembly outlet section and (B) coupling said load means through a second one way directional means to said first valve assembly outlet section whereby upon actuation of said pilot first stage the second stage is opened and the coupling means is pressurized to provide a load sense signal through said first one way directional means and on the load sense line and upon deactuation of said pilot first stage and the second stage is closed and the coupling means is depressurized to remove the load sense signal on the load sense line.

4,401,010
VARIABLE-TORQUE-ACCOMMODATING MACHINE

George D. Eddington, 1500 Highland Cove La., Salt Lake City, Utah 84106, and Herbert W. DeVitt, Jr., 274 S. 12th East, Salt Lake City, Utah 84102

Filed Nov. 10, 1980, Ser. No. 205,792
Int. Cl.³ F01L *25/08, 15/16*
U.S. Cl. 91—273 12 Claims



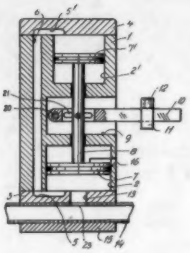
1. A variable-torque-accommodating machine, comprising at least one piston and cylinder, the piston being fixed to a piston rod at one end thereof and adapted to reciprocate within the cylinder, the opposite end of said piston rod extending exteriorly of the cylinder and the cylinder having fixed cylinder heads closing respective opposite ends thereof and having a secondary cylinder head adjacent to one of the fixed cylinder heads and movable back and forth within the cylinder in opposition to the piston, the piston rod extending exteriorly of the cylinder through the other fixed cylinder h ·d; work means; a connecting rod connected to the work me▸ s and adapted to be reciprocated for operating said work means; a lever rod pivotally linking the piston rod with the connecting rod so that reciprocation of the former will reciprocate the latter; fulcrum means mounted on the lever rod for back and forth movement therealong as a shiftable fulcrum for said lever rod; means associated with opposite ends of the lever rod and with said fulcrum means for constraining travel of the linked ends of the piston rod and the connecting rod and of the fulcrum means to predetermined paths so that the stroke of said connecting rod remains constant while the stroke of said piston rod is varied; means for moving said secondary cylinder head forwardly or backwardly in the cylinder in response to changes in torque encountered by the work means from time to time during operation of said machine; means for similarly shifting said fulcrum means along the lever rod; means for introducing a pressure fluid into the cylinder alternately at opposite faces of the piston; means for exhausting said pressure fluid from said cylinder alternately at opposite faces of said piston while the pressure fluid is being introduced into the cylinder at the respective reverse faces of said piston; and means for controlling said secondary-cylinder-head-moving-means and said fulcrum-means-shifting-means in accordance with changes in torque encountered by the work means from time to time during operation of said machine.

4,401,011
METHOD TO ADJUST AND/OR INDICATE A LIQUID OR GASEOUS PRESSURE, AND A DEVICE FOR UTILIZATION OF THE METHOD

Kurt-Ake Wallberg, Tulpanvägen 1, Vallentuna, Sweden (S-186 00)

Filed May 28, 1980, Ser. No. 154,034
Int. Cl.³ F15B *15/22, 15/17;* F01B *9/00*
U.S. Cl. 91—400 11 Claims

1. Device for indicating fluid pressure in a fluid pressure system comprising a housing, at least one cylinder within said housing, at least one piston means linearly movable in said cylinder, said piston means having at least two pressure surfaces facing in opposite directions with respect to each other, a fluid medium under pressure communicating with said pressure surfaces, one of said pressure surfaces having a smaller effective area in relation to the other pressure surface, and means pivotally attached to said housing arranged to impose an added mechanical load to the force produced by said fluid pressure on the smaller pressure surface, the sum of said load and force being arranged as a limiting value which equals the

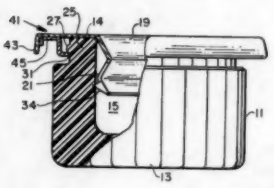


force produced by said fluid pressure on the larger piston area at a predetermined pressure to prevent linear movement of said piston means, said mechanical load being operatively arranged to indicate movement of said piston means in response to a change in said pressure.

4,401,012
PISTON FOR DISC BRAKES

John E. Emmett, Farmington Hills, Mich., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 202,510, Oct. 31, 1980. This application Jun. 5, 1981, Ser. No. 270,731
Int. Cl.³ F16J *1/00, 1/10*
U.S. Cl. 92—248 7 Claims



1. A composite vehicular brake piston for activating vehicular brake shoe during braking of a vehicle comprised of a cylindrical resin body having an open end and a closed end and a metallic cap extending over the end wall of said open end and secured to said body by an anchoring means, wherein said body has a narrowed portion in the outer wall thereof contiguous to said open end, a bead being positioned on the outer wall in said narrowed portion to secure said metallic cap to said resin body by a snap fit over said bead, the end of said cap and the portions of said body adjacent said narrowed portion providing a groove adapted to receive a dust boot.

4,401,013
AIR CONDITIONING DEVICE

Toshio Ohashi; Yoshihiko Muto, and Masaru Takasaki, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

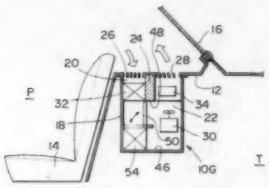
Filed Apr. 29, 1981, Ser. No. 258,626
Claims priority, application Japan, May 6, 1980, 55-60595[U]
Int. Cl.³ B60H *3/00*
U.S. Cl. 98—2.11 1 Claim

1. In a motor vehicle having a passenger compartment and a

trunk which are isolated from each other and bounded by a partition wall, an air conditioning device comprising:

a housing secured to said partition wall so as to project into said trunk, said housing having an air intake passage and an air discharge passage which are both open to the interior of said passenger compartment through respective openings formed in said partition wall, said housing also having first and second independent passages by which said air intake and discharge passages are connected independently of each other;

an air cleaner disposed in said air intake passage for cleaning air passing therethrough;



an electric heater disposed in said air discharge passage for warming air passing therethrough, adjacent said partition wall;

a humidifier disposed in said first independent passage for damping air passing therethrough;

an electric fan disposed in said air discharge passage for producing air flow in a direction from said air intake passage to said air discharge passage through said first and second independent passages; and

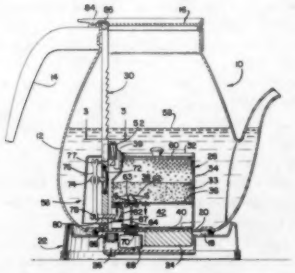
a damper door swingably disposed in said housing to selectively open and close said first and second independent passages.

4,401,014

AUTOMATIC COFFEE-BREWING APPARATUS

John F. McGrail, and Lois M. McGrail, both of 7701 Warner Ave., C197, Huntington Beach, Calif. 92647

Filed Nov. 23, 1981, Ser. No. 323,679
Int. Cl.³ A47J *31/18*
U.S. Cl. 99—283 **11 Claims**



1. An automatic coffee-brewing apparatus comprising:

a coffee pot;

a floatable brew module, said module being adapted to be releasably secured in a submerged position within said coffee pot, said floatable brew module comprising:

a basket adapted to receive and store coffee granules therein; and

at least one floatational cell attached to the underside of said basket, whereby said module is allowed to float after the coffee has been brewed;

means for releasably securing said module in a submerged position within said coffee pot, said releasable securing means comprising a thermal-release locking means;

means for heating water in said coffee pot to a brewing temperature, said means being located remotely from said coffee pot, and wherein said heating means comprises a hot plate containing a controlled heating element on which said coffee pot is supported;

means to agitate and stir said coffee granules and said water during brewing thereof, said agitating-and-stirring means comprising an impeller rotatably mounted in said basket of said module;

means for rotating said impeller remotely from said basket, wherein said means for rotating said impeller comprises:

a first magnetic member formed as part of said impeller;

an opposing remote second magnetic member adapted to be magnetically coupled to said magnetic member of said impeller; and

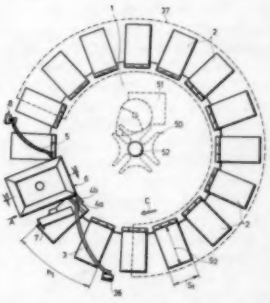
a motor adapted to rotate said remote second magnetic member, whereby said first magnetic member of said impeller will rotate therewith.

4,401,015

APPARATUS FOR THE BAKING OF IRREGULARLY TRIMMED WAFFLE, MAINLY CHEESE WAFFLE

Janos Ziegler, Budapest, Hungary, assignor to Licencia Alalmanyokat Ertekesito Vallalat, Budapest, Hungary

Filed Mar. 27, 1981, Ser. No. 248,368
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—373 **4 Claims**

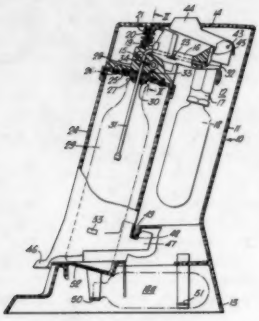


1. Apparatus for baking irregularly trimmed waffles, having heatable, closable baking irons (2) comprising an upper and lower baking plate (*2a*, *2b*) which are closed during the baking process, and form a baking plate pair and open in feeding position, the baking plate pairs (*2a*, *2b*) of the baking irons (2) having flat surfaces forming the sides of the waffle, but leaving the edges free; a device for forwarding the baking irons (2) on an endless path, to which the lower baking plates (*2b*) of the baking irons (2) are fixed, an opening cam (3) and a closing cam (5), which coact with the upper baking irons in a certain section of their path of motion, a removing unit (7) disposed between the opening cam (3) and closing cam (5) so as to coact with the lower baking plates (*2b*), said removing unit scraping across said lower plates to remove the baked waffles from the lower baking plates in the direction of movement of the removing unit across the lower baking plates, a feeding device (6) arranged after the removing unit (7) in the direction of progress of the baking irons (2) which supplies the lower baking plate (*2b*) of the open baking irons (2) with a portion of raw batter, and means pressing downwardly on the upper surface of the waffle as it is removed from the lower baking plate, thereby to discharge the baked waffle downwardly between its associated baking plate and the next of said baking plates.

4,401,016
AERATED DRINKS MACHINE

Francis J. Adams, Poling; Robert P. Child, Cosham, and Barry G. Charles, Rowlands Castle, all of England, assignors to Thorn Emi Domestic Electrical Appliances Limited, London, England

Filed Feb. 22, 1982, Ser. No. 351,170
Claims priority, application United Kingdom, Feb. 24, 1981, 8105758
Int. Cl.³ B01F *3/04*; A23L *2/40*
U.S. Cl. 99—323.1 **10 Claims**

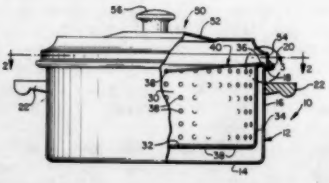


1. An appliance for making an aerated beverage, said appliance comprising a casing, a support member pivotally mounted on said casing, a connection carried by said support member for mounting a container of pressurized liquid carbon dioxide, a shatterproof housing for a bottle of water carried by said support member, a nozzle communicating with said connection and extending from said support member downwardly within said housing, a stopper for engaging in the neck of a bottle, means for supporting the bottle in said housing so that the stopper in engaged therein, and a safety pressure valve connected to the interior of the bottle when the stopper is engaged in its neck, the pivotable connection between the casing and the support member causing the shatterproof housing, the nozzle, the stopper and the container of pressurized liquid carbon dioxide all to pivot therewith relative to the casing, as a pivotal assembly, from a first position in which the bottle can be introduced into or removed from the housing and a second position in which the means for supporting the bottle engage the bottle to prevent its removal.

4,401,017
STEAMER POT ASSEMBLY

Gerald M. Feld, Van Nuys, Calif., assignor to Trend Products Company, Van Nuys, Calif.

Filed Jul. 14, 1982, Ser. No. 398,751
Int. Cl.³ A47J *27/04*
U.S. Cl. 99—413 **11 Claims**

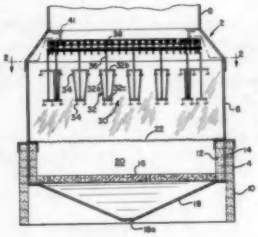


1. A steamer pot assembly comprising:
(a) a pot having a bottom, and a wall extending therefrom and having at its upper end an out-turned lip and a surrounding upstanding flange,
(b) a perforated steamer basket within said pot and having a bottom, spaced from the bottom of the pot, a wall spaced from the wall of the pot and having at its upper end and out-turned lip resting on the lip of the pot,
(c) bail means comprising at least one bail having two ends pivotally secured to the wall of the steamer basket adjacent the upper end thereof and having an intermediate portion thereof resting on the lip of the steamer basket, and
(d) a lid having a lower edge adapted to rest on one of said lips.

4,401,018
COOKING APPARATUS

Uylsses Berry, 154 W. 103rd St., Chicago, Ill. 60628

Filed May 14, 1981, Ser. No. 263,365
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—420 **11 Claims**



1. An apparatus for cooking food items comprising:
housing means for forming an enclosure for cooking food items;
said housing means including a lower chamber in which a source of heat may be produced and an upper continuous horizontal track mounted within said enclosure;
bracket means coupled to said housing means and suspended above said heat producing chamber to support food items to be cooked;
said bracket means including a plurality of spaced bracket members disposed above said source of heat;
said bracket members being mounted on said continuous horizontal track to movably suspend said bracket members downward therefrom for continuous motion in an orbital path above said heat producing chamber;
said bracket members each supporting at a lower portion thereof a selectively removable hanger for suspending the food items above said heat producing chamber, each of said hangers having a plurality of retaining elements to support a plurality of items above the heat;
drive means operatively coupled to said bracket means for causing said bracket members and its associated hanger to move relative to said track, said drive means including an endless member in operative contact with at least some of said bracket members and said drive means further including means to cause movement of said endless member; and
said hangers each include a bottom portion having a plurality of hooks arranged in a plurality of horizontal planes and an upper portion having an upper curved end to attach to an aperture of the lower portion of said bracket member.

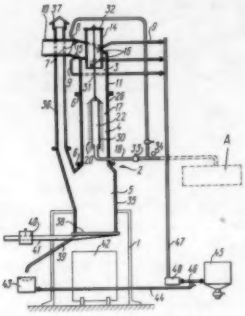
4,401,019
APPARATUS FOR THERMOCHEMICAL TREATMENT OF CRUSHED STRAW AND OR DRY FODDER MIXTURES

Alexandr Y. Leonov, ulitsa Pushkina, 7, kv. 29; Georgy G. Matveev, ulitsa Novobulvarnaya, 121, kv. 14; Leonid V. Morozov, ulitsa Promyshlennaya, 51-a, kv. 10, and Vladimir A. Bobovsky, Moskovsky trakt, 59, kv. 2, all of Chita, U.S.S.R.

Continuation of Ser. No. 930,853, Aug. 3, 1978, abandoned. This application Oct. 29, 1980, Ser. No. 201,596

Int. Cl.³ A23K *1/00*

U.S. Cl. 99—471 **11 Claims**



1. An apparatus for thermochemical treatment of crushed straw or dry fodder mixtures comprising:

in combination:

a vertical vessel formed of three vertically communicating chambers including:

a first cyclone-type chamber for moistening and preheating of said mixtures and having a loading opening in the upper part thereof;

first means for feeding crushed straw and dry fodder mixtures under pressure through said loading opening, said first feeding means contributing to the creation of a swirling flow in said cyclone-type chamber;

second means for feeding steam to the upper part of said cyclone-type chamber, said second means being provided with atomizing nozzles extending into said cyclone-type chamber and oriented so that steam is supplied in the direction of flow of said crushed straw and dry fodder mixtures;

third means for feeding chemical solutions to the upper part of said cyclone-type chamber, said means for supplying chemical solutions having atomizing nozzles extending into said cyclone-type chamber and oriented so that a chemical solution is supplied both in co- and counter-current with the flow of the crushed straw and dry fodder mixtures;

a second chamber for thermochemical treatment of crushed straw and dry fodder mixtures and arranged under said cyclone-type chamber;

a heat distributor in said second chamber for thermochemical treatment and comprising a plurality of plates shaped as truncated cones each having a larger base and smaller base;

an opening made in the smaller base;

said plates being superposed on one another axially along said second chamber with spaces therebetween;

said openings in the smaller bases of the plates defining a passage for the descent of said mixtures;

means for conveying heat from a heat source to said distributor; and

a third, accumulating, chamber below said second chamber and having a diameter slightly larger than the diameter of said chamber for thermochemical treatment and, a rotatable bottom wall to provide an unloading opening in said accumulating chamber.

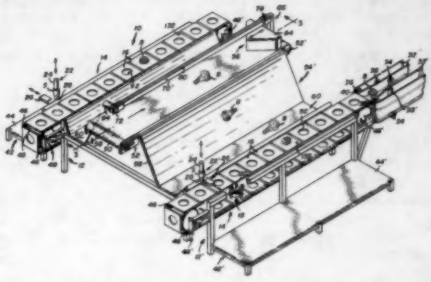
4,401,020
VEGETABLE BANDING APPARATUS

Robert A. Brux, Salinas, Calif., assignor to Seaco Industries, Salinas, Calif.

Filed Dec. 16, 1981, Ser. No. 331,153

Int. Cl.³ B65B *13/30*

U.S. Cl. 100—7 **34 Claims**



1. Vegetable banding apparatus, comprising, in combination:

(a) a supporting frame;

(b) conveyor means including a carrier conveyor moveably supported on said frame for receiving bundles to be banded, said carrier conveyor including a plurality of segments articulated to one another;

(c) expander means associated with said segments of said carrier conveyor for expanding and retracting elastic bands; and

(d) actuator means connected to said expander means for alternately expanding and retracting said expander means.

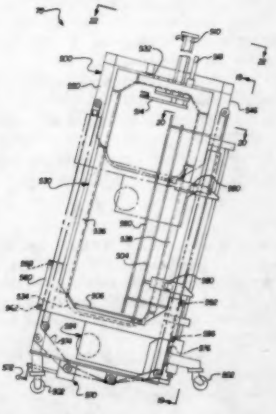
4,401,021
STACKER-TYER

Harry C. Noll, Jr., Rouses Point, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 1, 1981, Ser. No. 279,621

Int. Cl.³ B65B *13/04*

U.S. Cl. 100—14 **17 Claims**



1. A tyer for tying a strap around either a short stack of articles or a tall stack of articles, said apparatus comprising a frame, bottom support means in said frame for supporting the

bottom of a stack of articles, track means for guiding a strap around a stack, said track means circumscribing the bottom, top and two sides of a stack on said support means, said track means including a top track portion fixed to said frame, a bottom track portion fixed to said bottom support means, and first and second side track portions connecting said top and bottom portions to form a continuous track for guiding the strap around a tall stack, tie head means for feeding a strap through said track means around a stack and tying the strap, said tie head means being connected with said bottom track portion of said track means, said side track portions being removable, and means for raising said bottom track portion in said frame into engagement with said top track portion to form a continuous track for guiding the strap around a short stack.

4,401,022

DEVICE FOR BALING AGRICULTURAL CROP

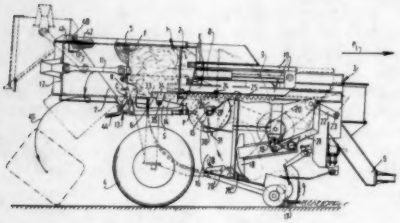
Hermanus H. Vissers, and Gijsbert J. Mijnders, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Continuation of Ser. No. 85,706, Oct. 17, 1979, abandoned. This application Jun. 16, 1981, Ser. No. 274,064

Claims priority, application Netherlands, Nov. 3, 1978, 7810948

Int. Cl.³ B30B *15/30, 15/32*

U.S. Cl. 100—100 **11 Claims**



1. A device for baling agricultural crop comprising a compression chamber having an inlet port in a sidewall, a driven pressing member adapted to reciprocate along said port, an auxiliary chamber having a crop inlet port and communicating with said inlet port for temporarily storing the crop to be compressed and a closing member periodically closing the inlet port and being rotatable about an axis transverse of the direction of movement of the pressing member for advancing the crop from the auxiliary chamber via the inlet port into the compression chamber wherein said closing member comprises a plurality of parallel elements each having a circular portion and a flap portion extending tangentially from said circular portion, said circular portions having outer circumference surfaces coaxial with and spaced along said transverse axis.

4,401,023

WORM PRESS

Günther Suhr; Manfred Knuth; Wilhelm Malchow, and Thorsten Homann, all of Hamburg, Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,345

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026477

Int. Cl.³ B30B *5/00, 9/12*

U.S. Cl. 100—148 **5 Claims**

1. A worm press comprising:

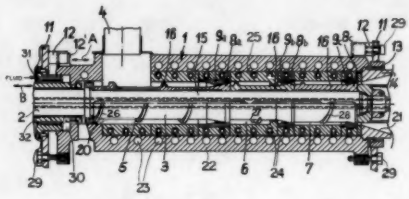
an elongated housing disposed between two walls and forming a pressing chamber extending along an axis from an inlet end to an outlet end;

an axially fixed worm extending axially in said chamber and rotatable relative to said housing, said worm comprising at least two axially spaced sections each formed with a respective worm flight;

a throttle ring fixed in said housing between said sections;

a throttle shoulder fixed on said worm between said sections, said ring having an inwardly directed frustoconical flank and said shoulder having an outwardly directed frustoconical flank juxtaposed with said inwardly directed frustoconical flank and defining a throttle gap therewith; and

means for relatively axially displacing said housing and said worm to adjust the width of said gap, a plurality of throttle gaps being provided in axially spaced relationship between said inlet and outlet ends, each of said throttle gaps being formed by a respective ring fixed in said housing and a respective annular shoulder fixed on said worm with each ring and the respective shoulder having juxtaposed frustoconical surfaces, said means for relatively axially displacing said housing and said worm including means on said walls and said ends of said housing for axially shifting said housing between said walls while preventing rotation of said housing about said axis.



4,401,024

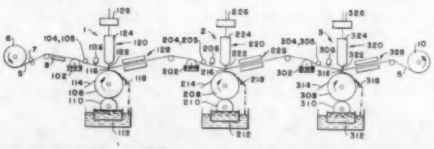
ELECTRONIC PATTERNING WITH REGISTRATION CONTROL

Zane Frentress, Stone Mountain, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 7, 1982, Ser. No. 366,119

Int. Cl.³ B41F *1/00;* **G01D** *15/06*

U.S. Cl. 101—93.01 **13 Claims**



1. A method for maintaining correct registration in a printing system having a plurality of print application stations for printing a pattern on a relatively moving substrate wherein the desired image is a composite made from the superposition of a plurality of constituent images, each constituent image being formed as a plurality of closely spaced pattern rows and wherein each constituent image is printed in row-by-row fashion at a respective print application station spaced along the path of the substrate, said method comprising:

(a) supplying a quantity of substrate to be printed having a plurality of reference marks fixed at intervals along the substrate in the direction of substrate movement;

(b) applying, at an initial print application station and at a pre-determined print gauge, a number of consecutive pattern rows within a substrate length defined by a first and a second of said plurality of reference marks, said second mark being preceded by said first mark;

(c) measuring said substrate length at said initial print application station;

(d) measuring said substrate length at a subsequent print application station following said initial station;

(e) comparing the results of said substrate measurements at

said initial and said subsequent print stations, thereby determining any change in substrate length, as measured at said initial and subsequent print stations, between said first and said second reference marks along the direction of substrate relative movement;

(f) adjusting said pre-determined print gauge for use at said subsequent print application station to permit the number of pattern rows applied between said first and said second marks at said subsequent print application station to equal the number of pattern rows applied between said first and said second reference marks at said initial print application station.

4,401,025

DEVICE FOR PIVOTING A PRINTING UNIT

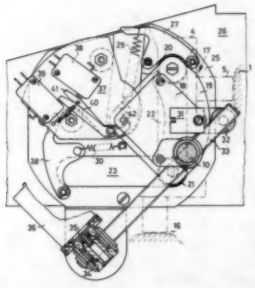
Peter Vogelhuber, Brigachtal, and Hans-Joachim Wysk, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,212

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118205

Int. Cl.³ B41J *3/00*

U.S. Cl. 101—93.05 **13 Claims**



1. A device for pivoting a printing unit, movable along a straight line parallel to the printing plane of a printing support, between two angularly spaced printing supports with the planes thereof disposed angularly of one another, said printing unit comprising a carrier, a printing head mounted on said carrier and including a printing member arranged to extend transversely of the printing plane of the printing support, a pair of side members spaced laterally apart in the direction of movement of said printing unit relative to the printing support, a guide shaft extending between said side members, said printing unit mounted on said guide shaft for movement thereon in the direction between said side members, and means for pivoting the combination of said guide shaft, side members and printing unit mounted on said guide shaft between angularly spaced printing supports whereby said printing member extends in a plane substantially perpendicular to the printing plane of the printing support and the combination is moved along an arc between the printing supports which arc is significantly flatter than the circular arcs defined by each radius extending from the intersection of the planes of said printing members disposed perpendicularly to the printing planes of the printing supports to a different one of the planes of the printing supports.

4,401,026

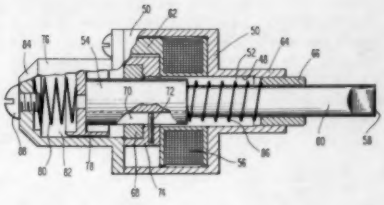
FREE FLIGHT HAMMER FOR IMPACT PRINTER

W. Sumner Brown, Cambridge, Mass., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 166,200, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 56,986, Jul. 12, 1979, abandoned, which is a continuation of Ser. No. 833,267, Sep. 14, 1977, abandoned. This application Jan. 18, 1982, Ser. No. 340,213

Int. Cl.³ B41J *9/30*

U.S. Cl. 101—93.33 **6 Claims**



1. Impact printing apparatus comprising:

a medium for receiving print;

a character element juxtaposed to said medium and adapted to contact with said print receiving medium; and

hammer means including an impact area movable between a rest position and an impact position thereby causing contact between said character element and said print receiving medium, the improvement residing in said hammer means comprising:

a stationary magnetic structure comprising a high permeability material and electrically energizable windings, said stationary magnetic structure having an opening therein with said material on opposite sides thereof so as to form an axially extending unobstructed magnetic air gap;

a movable magnetic structure rigidly coupled to said impact area, said movable magnetic structure comprising a high permeability material adapted to move substantially axially through said opening from a first position partially closing said magnetic air gap to a second position in a direction toward said character element substantially closing said magnetic air gap upon energization of said windings, the distance between said first and said second positions being less than the distance between said rest and said impact positions, the length of said movable magnetic structure being greater than the length of said axial air gap and greater than the distance between said rest and said impact positions, said movable magnetic structure being free for axial movement through said gap such that said movable magnetic structure substantially closes said air gap before and until said impact area causes a character element to contact said medium and said movable magnetic structure is in substantially free flight at a substantially constant velocity when said contact occurs; and

a detent spring contacting said movable magnetic structure for maintaining said impact area away from said character element except when said windings are energized, said spring providing insufficient resistance to substantially affect the free flight of said movable magnetic structure.

4,401,027

PRINTING MECHANISM

Hirofumi Hirano, Arakawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Apr. 21, 1981, Ser. No. 256,038

Claims priority, application Japan, Jun. 12, 1980, 55-78360

Int. Cl.³ B41J *7/00*

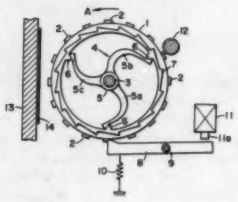
U.S. Cl. 101—106 **2 Claims**

1. A printing mechanism comprising: a cylindrical type

wheel having a circumferential surface with a plurality of types arranged at equal angular intervals on the outside thereof and a plurality of projections arranged at equal angular intervals on the inside thereof; a continuously rotatable drive shaft disposed inside of and associated with said type wheel for rotating said type wheel;

a stop means for stopping rotation of said type wheel to print a selected type, and drive means to both rotate said type wheel without effecting printing and to provide energy to effect printing by said type wheel in response to actuation of said stop means, said drive means including an elastic member fixed on said drive shaft and having a plurality of resilient arms for supporting said type wheel and for disposing said type wheel concentric to said drive means;

wherein said elastic member normally spacing the plurality of types provided on said type wheel from a platen by a predetermined distance, an end of at least one of said plurality of resilient arms contacting one of said plurality



of projections to rotate said type wheel without effecting printing, said stop means being movable to engage said type wheel to stop rotation thereof relative to said drive shaft and cause said type wheel to rotate about the point of said type wheel which is engaged by said stop means in an eccentric path relative to said shaft by utilizing energy produced by the contact of at least one of the ends of said plurality of arms with at least one of said plurality of projections so that said type wheel strikes a selected type against the platen to cause printing, actuation of said stop means and striking of a selected type against said platen causing said continuously rotated drive shaft to rotate said resilient arms over and past said projections thereby terminating the rotation of said type wheel by said elastic member and completely separating said resilient arms from said projections, at least one of said resilient arms reestablishing a driving contact with one of said projections subsequent to said type wheel being separated from the recording medium.

4,401,028

PRINTING MACHINE WEB GUIDING ARRANGEMENT

Ingo Köbler, Anhausen, and Rainer Burger, Augsburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,494

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045051

Int. Cl.³ B41F *5/08, 13/02*

U.S. Cl. 101—178 **4 Claims**

1. Printing machine having

a frame structure (1);

a printing station having two printing cylinders (2, 3);

means (4) supplying at least one web (5, 11) of paper on which printing is to be effected;

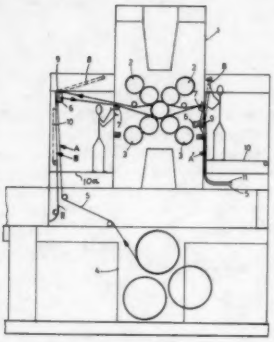
and guide roller means guiding said at least one web of paper in an upwardly directed path from a supply means (4) to the printing station and laterally between said two printing cylinders,

comprising

a selectively positionable guide roller (6), movable in a direction toward and away from the printing cylinders;

a pivot arm (8) having a pivot point at one end adjacent the printing station, carrying said guide roller (6) at the other end, and selectively positionable, in, respectively, approximately horizontal direction or approximate vertical direction to place the guide roller (6) remote from the printing station, when the pivot arm is positioned in horizontal direction, thereby placing the upwardly directed path of the web remote from the printing station,

or, selectively, to place the guide roller (6) close to the printing station and at the distance from the pivot point corresponding to the length of the pivot arm, and thereby placing the upwardly directed path of the web close to the printing station;



a system guide roller (7) positioned close to said printing cylinders and guiding the path to the web from said guide roller (6) to the printing cylinders in essential alignment therewith, said system guide roller (7) in position in an essentially straight line between the movable guide roller (6) when said movable guide roller is remotely placed, and defining the path of the web when the movable guide roller is placed close to the printing station;

and movable support means (10) positionable essentially horizontally when the movable guide roller (6) is located to position the path of the web close to the printing cylinders, said support means being located at the side of the web remote from the printing cylinders and comprising

a pivotable platform having a pivot axis adjacent the upwardly directed path (A) of the web when the guide roller (6) positions said path remote from said printing cylinders.

4,401,029

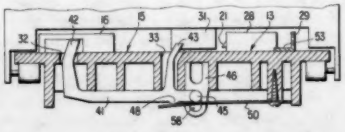
CREDIT CARD IMPRINTER WITH CARD-SENSING FORM INSERTION INTERLOCK

William P. Barbour, Crystal Lake, Ill., assignor to DBS, Inc., Randolph, Mass.

Filed Dec. 24, 1981, Ser. No. 334,281

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—269 **12 Claims**



1. A data recorder for imprinting data from a credit card to a form, said recorder comprising a printing bed and a printing platen mounted for movement across said bed, said bed being

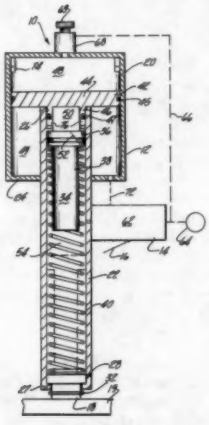
adapted to receive said card and said form in a printing location whereby movement of said platen across said printing location causes information to be transferred from said card to said form, said bed including card sensing means for sensing the presence or absence of said card in said printing location and form displacement means responsive to said card means sensing the absence of the card in the printing position for displacing the form away from the bed in the path of the platen when the platen is moved across the printing location so that the form is swept aside to thereby prevent imprinting of the data onto the form whenever the card is not present in the printing location.

4,401,030

PORTABLE MARKING TOOL

John E. Connolly, Wyoming, and Mark D. Huggett, Battle Creek, both of Mich., assignors to Gator Manufacturing, Inc., Battle Creek, Mich.

Filed Jun. 15, 1981, Ser. No. 273,510
Int. Cl.³ B41F *1/06, 17/00*
U.S. Cl. 101—316 **8 Claims**



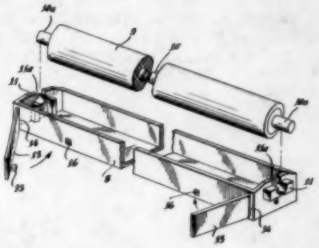
1. A portable marking tool comprising: a cylindrical housing member, a cylinder disposed coaxially with said housing and having an open end communicating with the interior of said housing, a movable wall member disposed for movement in said housing and having a piston slidable in said cylinder to open and close communication with said housing, a marking assembly supported at an end of said cylider for limited axial movement and including a movable marking element engageable with the workpiece to be marked, a piston member in said cylinder and having a rod portion normally disposed in spaced relationship to said marking element for movement into engagement therewith, said movable wall forming a first chamber at one side of said movable wall and a second annular chamber at the other side of said wall within said housing and outside of said cylinder, said piston member forming a third chamber in said cylinder between said piston member and said piston of said movable wall when said movable wall is in a position closing the open end of said cylinder, a fourth chamber being formed in said cylinder between said piston member and said marking member in communication with the atmosphere, passage means placing said fourth chamber in continuous communication with said third chamber, means for maintaining a charge of fluid at a predetermined constant pressure in said first pressure chamber except during movement of said movable wall, supply means for selectively delivering pressure to said second pressure chamber to move said movable wall against the resistance of said charge of fluid in said first chamber and slide said piston portion outwardly relative to said open end to place said second pressure chamber and third pressure chamber in communication with each other to move said piston member to strike against said marking member to mark a workpiece, and means consisting of said charge of fluid in said first chamber to return said movable wall to a position wherein said piston portion recloses said open end of said cylinder.

4,401,031

DISPOSABLE SELF CONTAINED INK CARTRIDGE FOR VALUE PRINTING DEVICE

Danilo P. Buan, Easton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,933
Int. Cl.³ B41F *1/46*
U.S. Cl. 101—363 **6 Claims**



1. A disposable cartridge for inking the print characters of a value printing device, the value printing device being of the type having a movable inking carriage with longitudinally opposed openings, which comprises:

(a) a housing having an extending opening;

(b) inking means rotatably mounted within said housing and extending through said opening;

(c) at least one handle member fixed to said housing; and

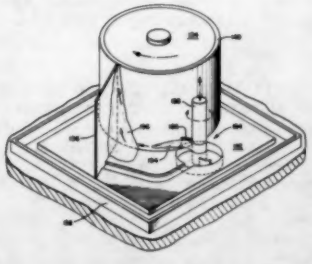
(d) a pair of lugs each of which is located at an opposite end of said housing, the lugs being receivable within said carriage openings to support said housing; whereby said housing may be inserted and removed into and out of said inking carriage by use of said handle member.

4,401,032

VERTICAL INK METERING APPARATUS

Scott R. Albin, Hockessin, Del., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 212,012, Dec. 1, 1980, Pat. No. 4,384,518.
This application Apr. 14, 1982, Ser. No. 368,266
Int. Cl.³ B41F *31/00*
U.S. Cl. 101—363 **7 Claims**



1. Vertical ink metering apparatus comprising:

a vertical ink roll having a smooth, soft surface of elastomeric material and adapted to rotate about its vertical axis, said lower end of the ink roll suspended in a supply of ink;

a stationary, annular ink trough containing said ink supply, the lower end of said ink roll being configured so that only the lower, peripheral end portion of the roll rotates through the ink supply in the trough; and

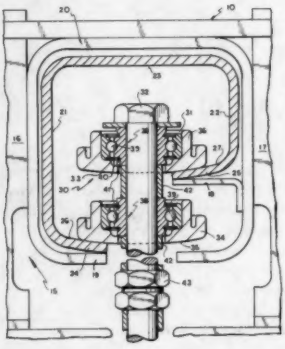
a flexible doctor blade preloaded against the ink roll surface so that its edge contacts the surface along a vertical line parallel to its axis, whereby ink is applied as a thin, uniform film on the surface of the ink roll by the doctor blade as the ink roll rotates through the ink supply in the stationary, annular trough.

4,401,033

COUNTER-ROTATING TROLLEY AND TRACK SUSPENSION SYSTEM

Carl F. Gerken, New Castle, Ind., assignor to American Standard Inc., New York, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,405
Int. Cl.³ E05D *13/02*
U.S. Cl. 104—94 **5 Claims**



4. A track assembly having means for mounting said track along an overhead structure for moving an operable wall panel and trolley assembly therealong, said track comprising:

a pair of diametrically positioned rails which are vertically spaced in substantial parallel alignment to define between them a passage for the movement of a trolley assembly therealong;

said upper rail is formed having a cylindrical surface generated from a centerpoint whose locus lies above said cylindrical surface along the axial center line of said track; and

said lower rail is formed having a cylindrical surface generated from said centerpoint of said upper rail so that the radii of curvatures of said rails are unequal wherein the surfaces generated thereby are similar but not congruent.

4,401,034

AERIAL CABLEWAY HAVING A RETURN SHEAVE WITH A SPEED STABILIZATION DEVICE

Henri Gaudet, Bourg-la-Reine, France, assignor to Cie Miniere de l'Ogooue (COMILOG), Neuilly sur Seine, France

Filed Feb. 8, 1980, Ser. No. 119,942
Claims priority, application France, Feb. 27, 1979, 79 05909
Int. Cl.³ B61B *7/04, 11/00*
U.S. Cl. 104—178 **2 Claims**

1. An aerial cableway comprising:

a towing cable transporting a plurality of load carriers along an endless conveying run which extends between a driving station and a return station;

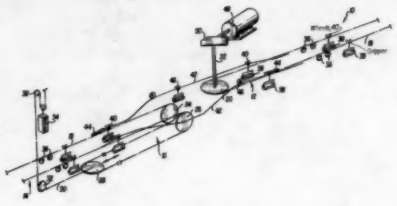
a cable drive sheave drivingly coupled to said cable and located in said driving station;

a cable return sheave drivingly coupled to said cable and located in said return station;

grips for coupling said load carriers to said towing cable and uncoupling said load carriers from the towing cable at the stations;

transfer rails in said statons for receiving and transfering the uncoupled load carriers;

a stabilization device for stabilizing the speed of rotation of said return sheave, said stabilization device comprising, an electric machine mechanically connected to said return sheave for driving and braking the return sheave, a power



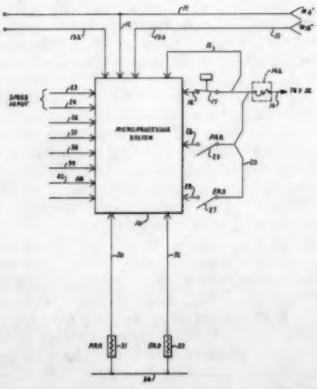
supply unit to power said electric machine, tachometer means for producing a first electric signal corresponding to the speed of the return sheave, speed selector means for producing a second electric signal corresponding to a selected speed, a control unit for controlling said electric machine, and receiving said first and second electric signals and producing an electric output signal when said first and second electric signals are not equal, said output signal being applied to said power supply unit for controlling said electric machine so as to brake the return sheave when said first signal is greater then said second signal and to drive the return sheave when said second signal is greater than said first signal.

4,401,035

CONTROL DEVICE FOR MULTIPLE UNIT LOCOMOTIVE SYSTEMS

Rudolph D. Spigarelli, Shreveport, La.; John L. Aker, and Fred M. Berry, both of Johnson County, Kans., assignors to Kansas City Southern Railway Company, Kansas City, Mo.

Filed Jul. 3, 1980, Ser. No. 165,724
Int. Cl.³ B60L *15/32*
U.S. Cl. 105—61 **22 Claims**



1. A control device for controlling a multiple unit locomo-

tive system having a plurality of individual locomotive units each having high and low throttle positions and a plurality of discrete throttle positions between the high and low positions for normal operation of the locomotive system, said control device comprising:

means for setting a predetermined set speed of the locomotive system;

sensing means for sensing the actual speed of the locomotive system; and

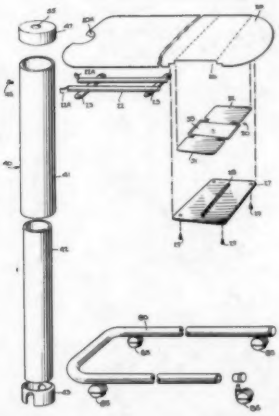
control means operable in response to the presence of a differential between the actual and set speeds to automatically and sequentially vary the throttle positions of the individual locomotive units between the high and low throttle settings thereof in a manner to effect substantial conformity of the actual speed with the set speed.

4,401,036

OVERBED TABLE

Joseph Russo; Richard Sonder, both of New York, N.Y.; Robert E. Miller, Charlotte, and Mark E. Cauthen, Pineville, both of N.C., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Feb. 3, 1981, Ser. No. 230,994
Int. Cl.³ A47B 9/00
U.S. Cl. 108—146 **4 Claims**



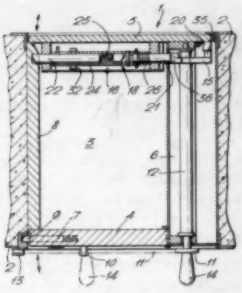
1. An overbed table comprising a base member; a support column mounted to said base member; a cantilever arm mounted to and extending horizontally from said support column; a table top having top and bottom sides and a groove on the bottom side thereof; a mounting bracket secured to the bottom side of said table top and extending over at least part of said groove, said cantilever arm extending within said groove and above said mounting bracket; said support column including a pair of telescoping members, said cantilever arm secured to one of said telescoping members; means for locking the relative positions of said telescoping members to prevent downward movement of said table top; means for unlocking the relative positions of said telescoping members, said unlocking means including a push cap mounted to a top end of one of said telescoping members whereby said table top may be lowered by applying pressure to said push cap.

4,401,037

SECURITY TRANSFER ARRANGEMENTS

Dermot J. Cahill, 137 Kimbolton Rd., Bedford MK41 8DT, England

Filed Sep. 1, 1981, Ser. No. 298,544
Claims priority, application United Kingdom, Sep. 8, 1980, 8028991
Int. Cl.³ E05G 7/00; B65D 91/00; E06B 7/00; E05C 1/06
U.S. Cl. 109—10 **16 Claims**



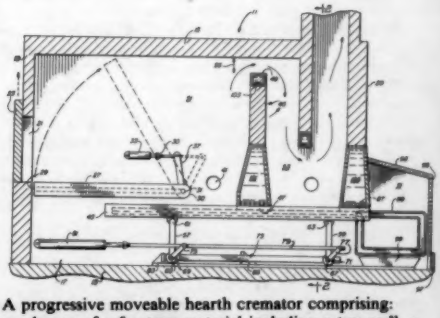
1. In a security transfer arrangement in which access to a chamber for entering items into, and removing them from, the chamber, is made via two mutually-spaced doors, and in which provision is made to enable the doors to be opened to give access to the chamber, only one at a time, the improvement wherein said arrangement includes a member that is displaceable between a first position in which it obstructs opening of one of the doors and a second position in which it is clear from obstructing said one door so as to free that door for opening, and door-closing means responsive to displacement of said member from said first position towards said second position to close the other door if such is then open.

4,401,038

PROGRESSIVE MOVEABLE HEARTH CREMATOR

William W. Segrest, P.O. Box 7796, Orlando, Fla. 32854

Filed Dec. 3, 1981, Ser. No. 327,027
Int. Cl.³ F23G 1/00
U.S. Cl. 110—194 **11 Claims**



1. A progressive moveable hearth cremator comprising:

an enclosure of refractory material including a top wall, a pair of side walls, a front wall, a rear wall and a floor;

a pivotable hearth coupled to said side walls at a pivot point;

means for rotating said pivotable hearth;

a secondary moveable hearth disposed partially below said pivotable hearth;

means for moving said secondary hearth from an initial position, of alternately downwards, sideways, upwards and back sideways to said initial position;

an interior wall disposed between said sidewalls and immediately adjacent to and in contact with the top of said secondary moveable hearth when said secondary moveable hearth is in its initial position, whereby said interior wall separates said enclosure into a primary and secondary chamber; and

at least one fuel burner disposed inside said enclosure.

11. A cremator comprising:

an enclosure of refractory material including a front wall with an opening therein, two side walls and a rear wall;

an interior wall disposed inside said enclosure and dividing the interior portion of said enclosure into a primary and secondary chamber;

a pivotable hearth disposing said primary chamber;

a secondary moveable hearth disposed with a portion in said primary chamber and a portion in said secondary chamber said hearth being in close contact with the bottom surface of said interior wall;

means for pivoting said pivotable hearth; and

means for alternatively displacing said moveable hearth from an initial position sequentially downward, sideways upwards, and back sideways to the initial position.

4,401,039

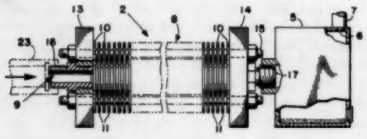
FUEL PREPARATION AND BURNING SYSTEM

Paul R. Goudy, Jr., 2016 Eastwood, Shorewood, Wis. 53211

Filed Sep. 23, 1980, Ser. No. 189,824

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **30 Claims**



1. A combustion apparatus, comprising a combustion chamber, inlet means for permitting fuel and air to enter said combustion chamber, outlet means for permitting exhaust products of combustion to exit said combustion chamber, and dispersing means in said combustion chamber for controllably dispersing a mixture of such fuel and air therein, said dispersing means comprising dividing means for dividing a mixture of such fuel and air into plural streams and combining means for recombining such streams, said combustion chamber comprising a housing with a flow path therethrough, said dividing means comprising plate means for blocking flow and plural opening means in said plate means for passing respective streams therethrough, said combining means for comprising further plate means for blocking flow and one opening means therein for passing a recombined flow stream therethrough, and means for holding said plate means and further plate means in said housing to position said plural and one opening means in said flow path, said plate means comprising thermally conductive heat transfer means exposed inside and outside of said combustion chamber for transmitting heat by conduction from inside said combustion chamber to the outside thereof.

4,401,040

THERMAL TORCH

Tibor J. Dobi, Budapest, Hungary, assignor to Volcano Corporation, Holland, Ohio

Filed Oct. 21, 1981, Ser. No. 313,468

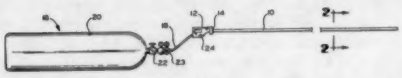
Int. Cl.³ F23B *7/00*

U.S. Cl. 110—349 **7 Claims**

1. A thermal torch comprising:

an elongate burner pipe having a longitudinal axis and open at both ends;

a bundle of elongate consumable rods disposed within the interior of said burner pipe, said rods having longitudinal axes parallel to and coextensive with said burner pipe and said rods having substantially identical cross-sectional configurations, said rods arranged to form at least a first and a second pressure fuel passage, the first passage extending between the inner surface of said burner pipe and the outer surfaces of the ones of said rods which are disposed adjacent the inner surface of said burner pipe, and the second passage extending between the inner surfaces



of the ones of said rods which are disposed adjacent the inner surface of said burner pipe and the outer surfaces of the remainder of said rods, the first and second passages being longitudinally coextensive with each other and with said burner pipe, the second passage having a greater capacity than the capacity of the first passageway; and

means providing communication between one end of said burner pipe and a source of oxygen under pressure.

4,401,041

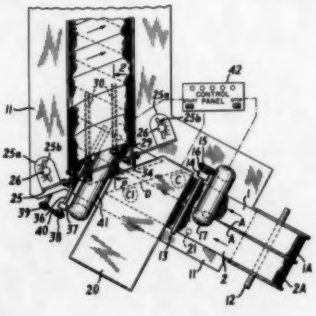
APPARATUS FOR MAKING HELICALLY WOUND TUBULAR ARTICLES

Harry R. de Polo, 480 Park Ave., New York, N.Y. 10022

Filed Apr. 21, 1981, Ser. No. 256,043

Int. Cl.³ D05B *33/00*

U.S. Cl. 112—63 **12 Claims**



1. Apparatus for making tubular articles formed of a length of material wound into helical form and having contiguous edges of successive convolutions of said material joined with one another, said apparatus comprising

forming means comprising an open frame and a plurality of parallel elongate supports projecting from one side of said frame and arranged to define a generally cylindrical configuration

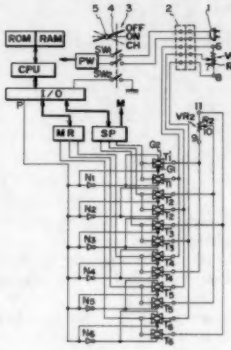
means for feeding said material in a lengthwise direction to said forming means, through the opening of said frame and around said supports in a helical path with edges of successive convolutions of the helix abutting with one another, and

means for joining said contiguous edges of successive convolutions of said material to form a continuous tubular article.

4,401,042
ELECTRONIC CONTROL SEWING MACHINE

Susumu Hanyu, and Kenji Kato, both of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,671
Claims priority, application Japan, Mar. 25, 1980, 55-36844
Int. Cl.³ D05B 3/02, 69/18
U.S. Cl. 112—158 E 4 Claims



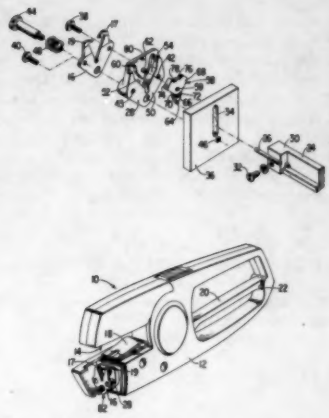
1. A sewing machine having a machine drive motor, stitch forming means driven by the machine drive motor to change the relative positions of a sewn fabric and a needle which is vertically and laterally reciprocated, a machine controller operated to control the rotation speed of the machine drive motor, and an amplitude adjusting device operated to adjust the lateral swinging amplitude of the needle, said sewing machine comprising a power source, a speed control circuit electrically connected to the machine controller by the power source, an amplitude adjusting circuit electrically connected to the amplitude adjusting device by the power source, switch means operated to take a first position in which the switch means opens the power source to make inoperative the machine controller and the amplitude adjusting device, a second position in which the switch means closes the power source to make operative the machine controller and the amplitude adjusting device, and a third position in which the switch means produces an operation mode changing signal, means for detecting a predetermined lapse of time after the switch means take the third position, means for identifying the predetermined lapse of time, and means receiving the operation mode changing signal after the identification of the predetermined lapse of time to electrically connect the amplitude adjusting circuit to the machine controller.

4,401,043
DOUBLE POINTED LOOPER ACTUATING MECHANISM FOR CHAIN STITCH SEWING MACHINE

Wesley R. Peterson, Bound Brook, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 23, 1982, Ser. No. 410,672
Int. Cl.³ D05B 1/06, 3/14
U.S. Cl. 112—199 9 Claims

1. In a sewing machine; a frame; a sewing needle reciprocable in the frame; a looper with two loop seizing points; camming means affixed to the looper and including two intersecting cam tracks; an actuator to slidingly engage the cam tracks alternately and effect motion of the looper alternately placing each of the two loop seizing points in cooperative engagement with the needle for the formation of chain stitches; a gate movable with respect to the cam tracks and including a part which extends between the tracks at the intersection thereof, said gate during movement of the actuator in each track being movable by the actuator from a held position wherein the entrance to the track with the actuator therein is open and the entrance to the other track is closed by the extending gate part, to another held position wherein the entrance to the track with the actuator therein is closed by the extending gate part and the entrance to the other track is open, said extending gate part

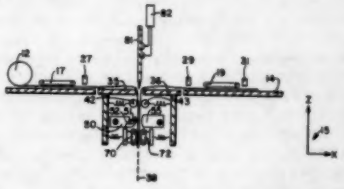


being resiliently movable with respect to another part of the gate to thereby enable the actuator to exit from each track by temporarily moving the said extending gate part from its position closing the entrance thereto.

4,401,044
SYSTEM AND METHOD FOR MANUFACTURING SEAMED ARTICLES

Philip N. Bowditch, Cohasset, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 4, 1981, Ser. No. 231,381
Int. Cl.³ D05B 97/00, 21/00
U.S. Cl. 112—262.3 8 Claims



1. A system for manufacturing articles from an elongated strip of material having an associated reference axis in its elongated dimension, said article being characterized by one or more seams, each seam joining an associated set of non-colinear curvilinear segments of said strip of material, comprising

folding means for receiving said strip of material in the direction of said reference axis,

said folding means including means for folding said strip of material along a fold axis, said fold axis being between said associated set of non-colinear curvilinear segments and being angularly offset from said reference axis, whereby at least one set of curvilinear segments for one seam are mutually adjacent,

joining means including a joining head for joining said adjacent set of curvilinear segments for at least one seam, and

cutting means operative after said joining means, said cutting means including means for cutting portions of said material adjacent to said joined segments and not a part of said article.

5. A method for manufacturing articles from an elongated strip of material having an associated reference axis in the elongated dimension, said articles being characterized by one or more seams, each seam joining an associated set of non-colinear curvilinear segments of said strip of material, comprising the sequential steps of:

A. receiving said strip of material in the direction of said reference axis and folding said strip of material along a fold axis, said fold axis being between said associated set of non-colinear curvilinear segments and being angularly offset from said reference axis, whereby at least one set of curvilinear segments for one seam are mutually adjacent,

B. joining said adjacent set of curvilinear segments for at least one seam, and

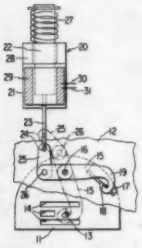
C. cutting portions of said material adjacent to said joined segments and not a part of said article.

4,401,045

THREAD TRIMMING MECHANISM FOR SEWING MACHINES

Angus R. T. Russell, Englishtown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 8, 1982, Ser. No. 440,054
Int. Cl.³ D05B *65/00*
U.S. Cl. 112—286 **8 Claims**



1. An underbed thread trimming mechanism for a sewing machine of the type having a movable thread picking element, a thread severing element, means shiftably supporting said thread picking element for movement between a retracted position in effective thread trimming relation with said thread severing element and an extended position suitable for engagement with sewing threads of said sewing machine, the improvement which comprises means for influencing movements of said thread picking element between said retracted and extended positions, said means including an electric solenoid having a frame,

a ferromagnetic armature shiftably supported in said frame and operatively connected to said thread picking element,

a spring means arranged to act between said armature and sid frame biasing said armature in a direction urging said thread picking element into said extended position,

a permanent magnet carried by said solenoid frame and having a magnetic flux generating capacity and position relative to said armature completely to neutralize the influence of said spring means on said armature,

solenoid coil means carried by said solenoid frame,

first switch means for applying electrical energy to said solenoid coil means effective to substantially cancel the influence of said permanent magnet on said armature and free said spring means to shift said thread picking element into extended position, and

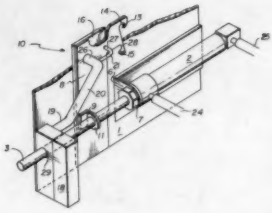
second switch means for applying electrical energy to said solenoid coil means effective with said permanent magnet to shift said armature in opposition to said spring means into said retracted position in effective thread trimming relation with said thread severing element.

4,401,046

PNEUMATIC THREAD UNDERCUTTER

Murel B. Bray, 3112 Rosa Ave., El Paso, Tex. 79905

Filed Aug. 4, 1981, Ser. No. 290,062
Int. Cl.³ D05B *65/02*
U.S. Cl. 112—298 **20 Claims**



1. A pneumatic thread undercutter for sewing machines and the like comprising in combination:

a frame disposed beneath a sewing area surface,

pneumatic means carried on said frame having an extensible rod means,

a moving blade means operatively connected to said extensible rod means to reciprocally translate laterally therewith,

said moving blade means provided with a cutting notch to sever a needle thread engaged thereby during lateral translation of said moving blade,

a stationary knife supported on said frame oriented adjacent said moving blade when said moving blade is in a retracted at rest position,

means on said moving blade to engage and retract a bobbin thread during a reciprocal lateral translation whereby the bobbin thread is severed by coaction of said moving blade against said stationary knife when said moving blade comes to rest, and

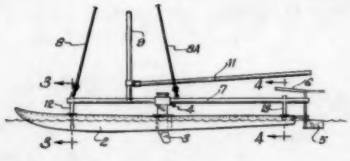
tensioning means attached to said frame and applied to said moving blade to constrain said moving blade tight against said stationary knife for severing the bobbin thread.

4,401,047

WIND-PROPELLED CRAFT

Alain G. Auras, 4011 Taos Dr., San Diego, Calif. 92117

Filed Jan. 19, 1981, Ser. No. 226,374
Int. Cl.³ B63H *9/04*; B63B *1/12, 41/00*
U.S. Cl. 114—39 **1 Claim**



1. A wind-propelled craft comprising:

at least two elongated, semi-flexible low-profiled and flatbottomed floats;

a framework adapted to support wind propulsion means and at least one user, said floats being distally and parallelly connected by said framework;

on each float, at least two articulated joints each having fore-and-aft rotational axes rotational independently of the joints of the other float, and transverse axes, said joints connecting said framework to the central fore-and-aft line of each of said floats such that said hulls are free to rotate about their fore-and-aft axes in response to changing heel

angles of said craft, and free to adjust about the transverse axes in response to pitch flexure of said hulls; and

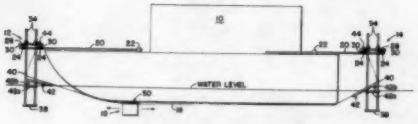
said floats containing openings medially positioned and lined with resilient bushings to house anti-slippage means which move with said framework when same heels such that said anti-slippage means enter the water at the angle of heel of said frame rather than straight, and said resilient bushing permits the non-orthonormal passage of said anti-slippage means through said openings while securing same against loose motion in said openings.

4,401,048

PORTABLE BOAT HULL SCRUBBER

Robert C. Rogers, 2836 Comanche Dr., Kettering, Ohio 45420

Filed Mar. 17, 1982, Ser. No. 359,189
Int. Cl.³ B63B *59/00*
U.S. Cl. 114—222 **6 Claims**



1. A portable boat hull scrubber for detachably mounting onto a floating boat, said scrubber comprising:

(a) forward and rear support structures adapted for attaching to the bow and stern of said boat and longitudinally extending therefrom, each of said support structures having a carriage laterally slidable to the longitudinal axis of said boat, at least one of said support structures further having at least one vertical element extending downward from said carriage and carrying a support track assembly having a guide track substantially parallel to the longitudinal axis of said boat and sloping downward from the horizontal toward said boat, and with the low end of said guide track proximate to the surface of the water floating said boat;

(b) an elongated flexible member for passing longitudinally below the hull of said boat, and with one end attached to the carriage of said forward support structure and the opposing end attached to the carriage of said rear support structure;

(c) a scrubber unit adapted for detachably suspending from said elongated flexible member and comprising:

(c-1) a hollow hermetically sealed buoyancy chamber having a substantially flat upper side;

(c-2) at least one disc scrubbing brush having upward extending bristles and being mounted on the upper side of said buoyancy chamber to be rotatable about a vertical axis;

(c-3) a controllable power source within said buoyancy chamber for rotating said disc scrubbing brush;

(c-4) a plurality of circular elements rotatable on parallel axes and mounted on a longitudinal side of said buoyancy chamber for detachably suspending said scrubber unit on said elongated flexible member;

(c-5) a plurality of idler rollers mounted on the longitudinal side of said buoyancy chamber opposite from the side mounting said circular elements and with the axes of rotation of said idler rollers parallel with the axes of rotation of said circular elements; and,

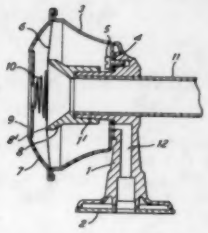
(d) means for moving said scrubber unit to and fro longitudinally on said elongated flexible member to thereby scrub a path on the hull of said boat, said idler rollers engaging said guide track as said scrubber unit emerges from the water to prevent said scrubber unit from dangling on said elongated flexible member.

4,401,049

ACOUSTIC WARNING DEVICE

Jean G. Bevillard, Evreux, France, assignor to Klaxon, S.A., Courbevoie, France

Filed May 5, 1981, Ser. No. 260,567
Claims priority, application France, May 30, 1980, 80 12026
Int. Cl.³ B06B *1/18*
U.S. Cl. 116—142 FP **1 Claim**



1. An accoustic warning device comprising:

(a) a moulded foot having a pneumatic inlet conduit and an annular surface parallel to the axis of the conduit, and a tubular protruberance projecting from said annular surface;

(b) a stamped hollow sheet metal body having an annular wall at one end and an annular rim at its opposite end;

(c) means for clamping said annular wall to said annular surface;

(d) a stamped metal lid secured to said annular rim by a joint;

(e) a diaphragm secured at its margin by said joint and lying between said annular rim and said lid;

(f) a spring located between the lid and the diaphragm;

(g) a tubular moulded member mounted on said tubular protruberance and having an annular projection having an annular lip that engages said diaphragm; and

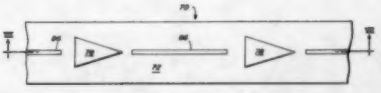
(h) a tubular part of a horn extending through said tubular protuberance and engaging in said tubular member, whereby a pressurized pnuematic fluid is applied to said conduit said diaphragm disengages from said annular lip and said horn is actuated.

4,401,050

PHOSPHORESCENT ESCAPE ROUTE INDICATOR

Laurence D. Britt, 12059 Old Forge Rd., Waynesboro, Pa. 17268, and Richard G. Britt, P.O. Box 3434, Peabody, Mass. 01960

Continuation-in-part of Ser. No. 271,618, Jun. 8, 1981, abandoned. This application Sep. 30, 1981, Ser. No. 306,970
Int. Cl.³ G01B *21/20*; E04H *6/42*
U.S. Cl. 116—205 **4 Claims**



1. A direction indicating tape capable of providing a visual and feelable indication of direction during periods of darkness comprising:

(a) an elongated strip of material, capable of being wound in a roll,

(b) adhesive means on the bottom side of said strip of material for securing said strip to a wall surface and spaced a predetermined distance from the floor,

(c) and a plurality of spaced phosphorescent, pointed shaped, indicator elements attached to a top side of said

sheet along its length, each phosphorescent indicator element having a thickness sufficient to be felt and comprising:

1. a layer of reflective plastic material,
2. a layer of a phosphorescent substance on top of said layer of reflective material, and
3. a layer of clear plastic material on top of said layer of phosphorescent substance, and elongated line-like embossed areas on said strip of material extending between said phosphorescent indicators for enabling a person to feel his way from one indicator element to the next.

4,401,051

PROCESS AND AN APPARATUS FOR EXTRACTING FINE DROPLETS OF PAINT FROM PAINT-SPRAYING UNITS

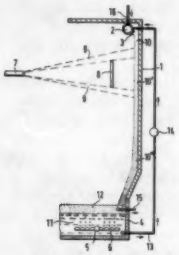
Paul Günther, Dietersheim, Fed. Rep. of Germany, assignor to Erich Salzle, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,939

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047527

Int. Cl.³ B05B *1/28, 15/04*

U.S. Cl. 118—326 **1 Claim**



1. An apparatus for spraying shaped members with paint by atomizing the paint mixed with metal pigments or color pigments to form a spray of droplets, directing the spray of droplets against the shaped member to be painted, from a spray booth having feeding means for aqueous calcium chloride solution in the upper part so as to allow the solution to flow down the walls in the form of a homogenous film, means for gathering and collecting the solution which has flowed down and taken up coagulated paint droplets and conducting the same into a settling or separating vessel, and a settling or separating vessel having a discharge pipe for the coagulated paint droplets in the upper area and a pipe for returning the regenerated calcium chloride solution from the lower area of the settling and separating vessel to the upper zone of the walls of the spray booth, said settling vessel being provided with nozzles for injecting air to promote the flotation of the coagulated paint droplets.

4,401,052

APPARATUS FOR CONTINUOUS DEPOSITION BY VACUUM EVAPORATION

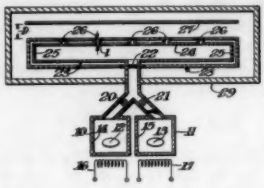
Bill N. Baron, Newark; Richard E. Rocheleau, Wilmington, and T. W. Fraser Russell, Newark, all of Del., assignors to The University of Delaware, Newark, Del.

Division of Ser. No. 43,317, May 29, 1979, Pat. No. 4,325,986. This application Mar. 26, 1982, Ser. No. 362,095

Int. Cl.³ C23C *13/12*

U.S. Cl. 118—718 **12 Claims**

1. Apparatus for deposition of material on a continuously moving substrate comprising a substantially closed evaporation chamber for containing the material to be deposited, means for heating said evaporation chamber to heat the material therein to the vapor state, a manifold chamber communicating with said evaporation chamber through a restricted diameter rate controlling orifice, said restricted diameter rate controlling orifice is formed by an apertured insert located in a conduit in flow communication with said evaporation chamber and said manifold chamber, a vacuum coating chamber



communicating with said manifold chamber through a plurality of nozzles arranged in a spaced array, and means for passing the substrate in said vacuum chamber adjacent to and spaced from said nozzles whereby the material is thereby deposited on the continuously moving substrate.

4,401,053

COATING FIXTURE

Thomas J. Riley, 905 Richmar Dr., Westlake, Ohio 44145

Filed Jul. 17, 1981, Ser. No. 284,393

Int. Cl.³ B05C *11/16*

U.S. Cl. 118—721 **10 Claims**

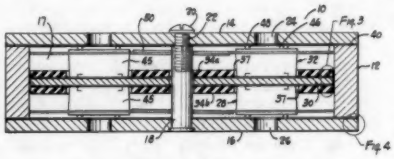


Fig. 3

Fig. 4

1. A coating fixture for holding workpieces during coating by vapor deposition comprising:

a rigid frame;

spaced apart face plates cooperable with said rigid frame to form a vapor coating deposition enclosure for holding a plurality of workpieces, said frame being between said face plates;

at least one of said face plates having a plurality of holes through which a coating vapor can be admitted to coat said workpieces; and,

gasket means on the inside face of said at least one face plate for sealingly engaging said workpieces, said gasket means having a plurality of openings correspondingly aligned with said plurality of holes to permit said vapor to pass to each workpiece separately.

4,401,054

PLASMA DEPOSITION APPARATUS

Seitaro Matsuo, Hachioji; Hideo Yoshihara, Sekimachi, and Shinichi Yamazaki, Chofu, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 27, 1981, Ser. No. 257,616

Claims priority, application Japan, May 2, 1980, 55/57877; Feb. 13, 1981, 56/18986

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—723 **12 Claims**

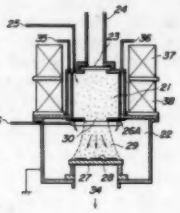
2. A plasma deposition apparatus having a vacuum vessel into which gases are introduced to generate plasma, molecules in said plasma being activated and reacted on a specimen substrate, on which a film is to be formed, so as to deposit a thin film on said specimen substrate, comprising:

a specimen chamber having a specimen table in an electri-

cally floating condition for placing said specimen substrate thereon;

a plasma formation chamber arranged separately from said specimen chamber for converting gases to be activated into the plasma condition, said plasma formation chamber being provided with a microwave introducing window, a microwave introducing means and a plasma extracting orifice which is formed in the wall opposite to said microwave introducing window for entracting a plasma stream generated in said plasma formation chamber into said specimen chamber, said plasma formation chamber having a shape and dimensions satisfying the conditions of a microwave cavity resonator;

a gas introducing system for said plasma formation chamber;



a gas introducing system for said specimen chamber so that gases so introduced are excited by said plasma; and

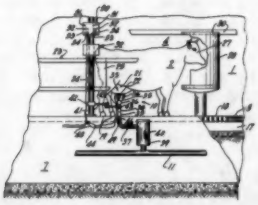
a magnetic circuit disposed at the periphery of said plasma formation chamber for forming a magnetic flux density necessary to bring about electron cyclotron resonance in said plasma formation chamber and for forming, in said specimen chamber, divergent magnetic field with a magnetic flux density having a decreasing gradient from said plasma formation chamber toward said specimen table in said specimen chamber so as to accelerate said plasma, and so that high speed electrons formed in said plasma formation chamber by said cyclotron resonance can reach said specimen along the lines of magnetic force.

4,401,055

ANIMAL PROTECTIVE APPARATUS AND METHOD FOR PROTECTING THE ANIMAL FROM ELECTRICAL POWER

William L. Street, 1833 N. 20th St., Sheboygan, Wis. 53801, and James W. Summers, Rte. 1, Oostburg, Wis. 53070

Filed Aug. 3, 1981, Ser. No. 289,160
Int. Cl.³ A01J *7/00, 5/00*
U.S. Cl. 119—14.03 **13 Claims**



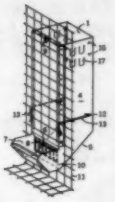
13. An animal milking system comprising a stall means for locating of the cows during a milking operation process, said stall means including conductive means engaged by the cow, an automated milking machine having udder connecting means and a hose means for transfer of milk from the cow to a collecting means, electrical potential balance means connected to said stall means and said milking machine and constructed and arranged to prevent creation of an effective potential difference between the cow's udder and said stall means by producing a compensating voltage whereby the cow is protected against current flow therethrough when connected to said milking machine.

4,401,056

FEEDING DEVICE FOR CAGED ANIMALS

Joe C. Cody, Sullivan, and Curt Rettke, Gray Summit, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 29, 1982, Ser. No. 372,871
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—18 **11 Claims**



1. A gravity flow feeder for caged animals comprising;

a rectangularly shaped container means with an open top having a bottom panel which slopes forward to a point beneath the bottom edge of the front panel of the container to create an opening in the bottom of said container, wherein a trough is provided adjacent to the bottom opening of the container on the outside thereof;

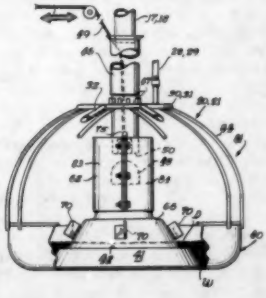
said front panel having a screen attached to the top edge thereof and overlaying the front panel on the inside of the container said screen being of a vertical length sufficient to at least partially cover the bottom opening of the container, said screen being of lesser width than said front panel whereby said screen has lateral and rearward movement so that as feed is added to the container it flows through the bottom opening into the trough and as the screen is moved by the animal a continual supply of feed from the container into the trough is provided.

4,401,057

HOG FEEDER

Carl W. Van Gilst, Goshen, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Oct. 5, 1981, Ser. No. 308,949
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51 R **28 Claims**



1. A feeder for supplying feed to hogs and like animals, comprising the combination of an immobile pan, a superstruc-

ture affixed over and to the pan, threaded shaft means journaled by and extending upwardly from the pan, rotor gate means disposed over the pan and threadedly attached to the shaft means, and latch means carried by the superstructure for selectively engaging the threaded shaft means to inhibit shaft means rotation when the rotor gate means is rotated, the rotation of the rotor gate means about the immobilized shaft means acting to raise and lower the rotor gate means relative to the pan means and thereby adjust the size of at least one feed delivery gate space defined between the rotor gate means and the pan.

4,401,058

GAS BOILER ABLE TO OPERATE IN A SEALED COMBUSTION CIRCUIT

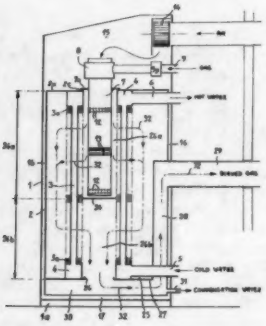
Elie Charrier, Boulogne, and Rene Fourno, Paris, both of France, assignors to Paquet Thermique, S.A., Beaumont S/Oise, France

Division of Ser. No. 247,929, Mar. 26, 1981, Pat. No. 4,366,778. This application Aug. 20, 1982, Ser. No. 409,875

Claims priority, application France, Mar. 27, 1980, 80 06823; Oct. 31, 1980, 80 23325

Int. Cl.³ F22B *9/02, 21/00*

U.S. Cl. 122—17 **11 Claims**



1. A gas boiler comprising an inner casing having a removable cover, an exchanger disposed within said inner casing and comprising finned tubes disposed vertically and connected to upper and lower manifolds, said inner casing having a top part and a burner disposed vertically through said top part with a portion of said burner extending into the space defined by said finned tubes, said burner having a portion retained by a sealing collar above said top part of said inner casing, said burner comprising a tubular body open at its top and whose section situated interiorly of said inner casing opposite said finned tubes is provided with multiple holes and is closed at its lower end below said multiple holes; a vertically disposed exterior casing surrounding said inner casing and said top part of said burner, said exterior casing having at its upper part a removable cover, said exterior casing forming a sealed fore-hearth comprising a space provided between said inner casing and the interior of said exterior casing; a gas intake means passing through the upper part of said exterior casing and being connected to said top part of said burner, said gas intake means having safety and control apparatus mounted thereon; a combustion air intake means connected to said upper part of said casing, a collector for discharging burnt gases connected to said inner casing and passing through said exterior casing, and means in said combustion air intake means for injecting air under pressure into said space from where the air under pressure penetrates into said burner through the open top thereof, said burner comprising at its top part a mixer for the gas and the air penetrating into said burner, said mixer comprising an annular jacket surrounding the tubular body of said burner and to which is connected said gas intake, a ring of gas injection holes provided in said tubular body of the burner opposite said annular jacket and a core for regulating the air intake section of said burner, slidably mounted for this purpose in the top part of said burner and which is movable, thus allowing easy in situ cleaning of the inside of the burner, said exchanger being divided into two parts in the vertical direction by a refractory floor, with the part of the exchanger situated above said floor containing the burner and functioning as an exchanger, the part of the exchanger being situated below said floor receiving cold water and serving both as an exchanger and as a condenser of the combustion products which are formed in the vicinity of the upper part, said refractory floor being situated below the bottom of the burner in the space limited by the tubes of the exchanger, means feeding the combustion products through the upper part and re-feeding laterally the combustion products into the lower part, means feeding water to be heated into the upper part after having recovered in the lower part the condensation heat from the water vapor contained in the combustion products; a tray provided in the lower part of the boiler for receiving the combustion products, burnt gases and condensation water, leaving the lower part; means for moving the burnt gases to the outside through an outlet pipe and tubing means for removing the condensation water.

4,401,059

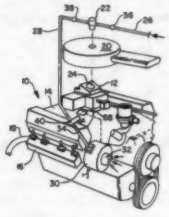
FLUID INJECTION SYSTEM, AND FLOW CONTROL DEVICE USED THEREIN, FOR AN INTERNAL COMBUSTION ENGINE

Toronta P. Goodman, Summit Point, W. Va., and Bruce Everling, Fairfax, Va., assignors to Goodman System Company, Inc., Armonk, N.Y.

Filed Aug. 5, 1981, Ser. No. 290,399

Int. Cl.³ F02D *19/00;* **F02M** *25/02*

U.S. Cl. 123—25 L **15 Claims**



1. A system for injecting fluid into a cylinder of an internal combustion engine, said system comprising fluid injection means for introducing air to said fluid for injecting said fluid into said cylinder at a rate proportional to the flow of said air; means for supplying air to said fluid injection means, said air supply means including a compressor for supplying pressurized ambient air at a constant flow rate, and means connecting said compressor to said fluid injection means; and control means in a responsive relation to the intake manifold of said engine and connected to said air supply means for varying the flow of air to said fluid injection means in response to pressure variations in said intake manifold.

4,401,060

FLUID INJECTION SYSTEM FOR A SUPERCHARGED INTERNAL COMBUSTION ENGINE

Toronta P. Goodman, Summit Point, W. Va., assignor to Goodman System Company, Inc., Armonk, N.Y.

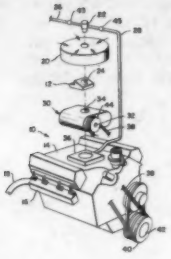
Filed Dec. 23, 1981, Ser. No. 333,450

Int. Cl.³ F02D *19/00;* **F02M** *25/02*

U.S. Cl. 123—25 R **13 Claims**

1. A system for injecting fluid into an internal combustion engine, said system comprising means for supplying an air/fuel mixture to said engine, means in a responsive relation to the

output of said engine for receiving said mixture from said supplying means and pressurizing said mixture in proportion to the demand on said engine, and flow passage means connected to a source of said fluid and to said pressurizing means for



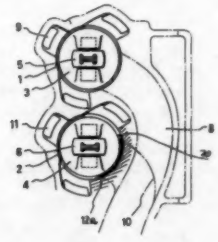
receiving said fluid and said mixture, said flow passage means being formed and arranged to draw said fluid from said source in response to the flow of said mixture and inject said fluid into said supplying means at a rate proportional to the pressure of said mixture.

4,401,061

REDUCTION OF DISTORTION OF PORTIONS OF THE CYLINDER WALL IN A TWO STROKE ENGINE

Yukio Matsushita, Iwata, and Yoshihiro Gohara, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 20, 1980, Ser. No. 161,230
Claims priority, application Japan, Jun. 29, 1979, 54-82429
Int. Cl.³ F02F *1/16*
U.S. Cl. 123—41.84 **18 Claims**



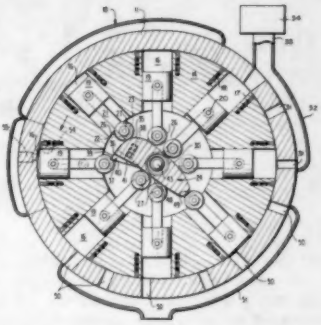
1. In a two stroke internal combustion engine wherein a pair of cylinders are juxtaposed to one another, and an exhaust passage passes from one of said cylinders along a path near the other of said cylinders, means to reduce localized heating of said other cylinder from said exhaust passage, comprising a spacing formed between said other cylinder and said exhaust passage, said spacing occupying a substantial frontal area between them and having no thermally conductive structure therein, whereby the entire area of said spacing functions as isolation means to isolate said cylinder from heat derived from exhaust gases in said exhaust passage, said other cylinder being provided as a sleeve in an engine block, said sleeve having an outer wall, said engine block having a bore with an internal wall surrounding, embracing and supporting said sleeve, said spacing being provided in the form of a relief in one of said walls.

4,401,062

ROTARY PISTON ENGINE

Joe O. Dean, 5841 NE. 22nd Ave., Fort Lauderdale, Fla. 33308

Filed Apr. 6, 1981, Ser. No. 250,930
Int. Cl.³ F02B *57/08*
U.S. Cl. 123—44 E **10 Claims**



10. A rotary piston engine comprising a relatively stationary housing, a rotor within the housing having a plurality of circumferentially spaced radial cylinder chambers, a corresponding number of reciprocating pistons in the cylinder chambers and revolving with said rotor within said housing, a stationary cam mounted centrally of the rotor and housing and profiled to produce reciprocation of each piston during rotor rotation in a manner to create a selected cycle of operation of each piston during each complete rotation of the rotor, cam follower means connected with each piston and movably engaging the profiled surface of said cam during rotor rotation, ignition means on said housing arranged to communicate with each cylinder chamber in succession during rotor rotation, said cam including an auxiliary spring-loaded cam plunger contained within said cam and having a tip projecting beyond the profiled margin of said cam to engage said cam follower means substantially at the instant of explosion in each cylinder and immediately thereafter to cushion the cam follower means as the latter moves smoothly into contact with an adjacent marginal portion of said cam which converts the power of explosion into rotation of said rotor, and said housing having circumferentially spaced intake and exhaust passage means adapted to communicate with each cylinder chamber in succession during rotor rotation and being circumferentially spaced from said ignition means.

4,401,063

FUEL DISTRIBUTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

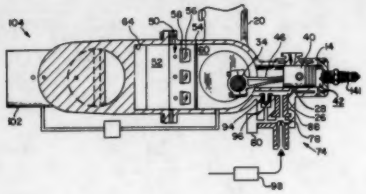
Elmer A. Haase, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 6, 1981, Ser. No. 251,688
Int. Cl.³ F02B *33/04*
U.S. Cl. 123—73 B **26 Claims**

1. In a two stroke cycle internal combustion engine having a housing with a series of bores therein, said bore having an entrance port and an exhaust port, a piston located in each bore for separating a supply chamber from a combustion chamber located therein, transfer conduits for connecting each supply chamber with a corresponding combustion chamber, a manifold system connected to said supply chambers, a control valve associated with each supply chamber for allowing air to flow into said supply chamber on movement of the piston toward the combustion chamber and for preventing communication from the supply chamber on movement of the piston toward the supply chamber, the improvement comprising:

a series of housings, each of which has a mixing chamber

located therein, a first nozzle connected to a source of fuel and said mixing chamber, a second nozzle through which the mixing chamber is connected to the entrance port, and an accumulator system connected to said supply chambers and each of said mixing chambers, the air in each of the supply chambers being compressed on movement of the pistons toward the supply chambers to raise the fluid



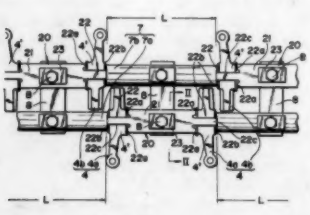
pressure of the air therein, a portion of the air under pressure being communicated from the supply chambers into the accumulator system to maintain the fluid pressure therein at a substantially constant level, the air in the accumulator system flowing into said mixing chambers entering the fuel supplied thereto through the first nozzles before being presented to the entrance ports through the second nozzles.

4,401,064

ROCKER ARM FITTING STRUCTURE

Makoto Nakamura, and Toshinari Hojima, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Feb. 13, 1981, Ser. No. 234,585
Claims priority, application Japan, Feb. 14, 1980, 55-17532[U]
Int. Cl.³ F01L *1/18*
U.S. Cl. 123—90.39 **14 Claims**



1. A mechanism for actuating a valve of an internal combustion engine, comprising:

a rocker shaft;

a rocker arm fitted to the rocker shaft;

a holding member at least partly made of an elastic material formed in a plate-shape for resiliently holding the rocker arm in position on said shaft;

the holding member including:

a pressing piece for biasing the rocker arm along the rocker shaft; and

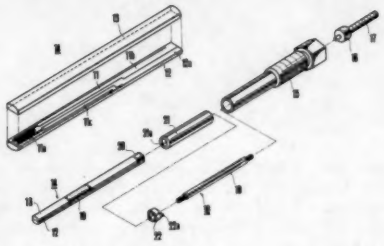
a receiving piece facing the pressing piece for receiving the rocker arm so that the rocker arm can be positioned between the pressing and receiving piece.

4,401,065

GLOW PLUGS FOR USE IN DIESEL ENGINES

Sokichi Minegishi; Tozo Takizawa, both of Higashi-matsuyama; Hideo Kawamura, Samukawa, and Nobukazu Sagawa, Kyoto, all of Japan, assignors to Jidosha Kiki Co., Ltd.; Isuzu Motors Ltd. and Kyoto Ceramic Co., Ltd., all of, Japan

Filed Aug. 12, 1981, Ser. No. 292,306
Claims priority, application Japan, Aug. 23, 1980, 55-116317; Aug. 23, 1980, 55-119820[U]; Aug. 23, 1980, 55-119821[U]
Int. Cl.³ F02P *19/00, 19/02;* H05B *3/00*
U.S. Cl. 123—145 A **18 Claims**



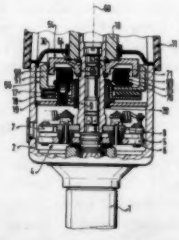
1. A glow plug for use in a diesel engine comprising a heating rod formed by bonding together a pair of ceramic rods having a resistor formed in a longitudinal direction of one bonding surface, a hollow electroconductive holder holding said heating rod at a front end, and an external connecting terminal connected to a rear end of said holder through an electrically insulating member, said resistor being constructed by a serially connected heating portion provided on a front portion of said ceramic rod, a lead portion extending from one end of said heating portion, a portion of said lead portion being exposed on the outer side of said heating rod and connected to said external connecting terminal, and another lead portion extending from the other end of said heating portion toward said rear end, a portion of said another lead portion being exposed to the outside of said heating rod and connected to said holder.

4,401,066

IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINES

Günter Brand; Richard Gerber; Karl Ehrmann, all of Stuttgart; Reinhold Kaufmann, Oberriexingen, and Harald Kalippke, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,745
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006257
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—146.5 A **3 Claims**



1. In an ignition distributor for internal combustion engines, a control generator having an annular coil (55), a rotor (54) and

a stator which includes an annular permanent magnet (17), a stator plate (18) and a pole disc (56),

said rotor (54) having a slotted annular plate portion on the inner rim of which a hub (63) is formed and pole teeth (59) extending axially from the outer rim of said plate portion which are made integrally with said plate portion and are of triangular cross-section in a radial plane,

said stator pole disc (56) being riveted to said stator (18) with said permanent magnet disposed therebetween, and having an annular plate portion (52) and axially prolonged teeth (51) extending axially from the outer rim thereof which are made integrally with said annular plate portion (52) of said pole disc and are of triangular cross-section in a radial plane,

said rotor pole teeth (59) and said stator pole teeth (51) partially overlapping each other and having their respective tips of triangular cross-section oriented towards each other and disposed for forming a working air gap in passing by each other, and

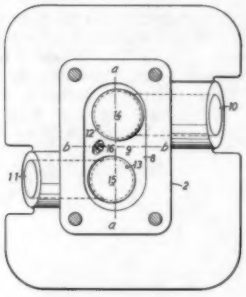
at least one of said rotor (54) and said stator pole disc (56) being molded of sintered iron.

4,401,067

VALVE PORTING FOR INTERNAL COMBUSTION ENGINE HAVING OBLONG CYLINDER

Shoichi Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,655
Claims priority, application Japan, Jul. 14, 1980, 55-95979
Int. Cl.³ F02F *3/28*
U.S. Cl. 123—193 P **3 Claims**



1. An internal combustion engine comprising

a cylinder, oblong in cross section with a long axis and a short axis;

a piston, oblong in cross section and mounted to slide in said cylinder;

a cylinder head closing said oblong cylinder;

an intake poppet valve;

an exhaust poppet valve, said intake and exhaust poppet valves being positioned in said head to communicate with said combustion chamber, being arranged in series in the direction of the long axis, being inclined with respect to said long axis, and each having a valve body extending on both sides of the long axis;

an intake passage and an exhaust passage in said cylinder head communicating with said oblong combustion chamber through said intake and exhaust valves respectively, said intake and exhaust passages extending away from said long axis in the direction of inclination of said intake and exhaust valves respectively, said intake and exhaust valves further being arranged to move toward the plane of said long axis upon opening;

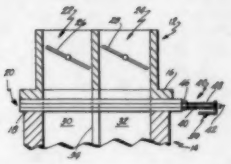
and further including a spark plug located through said head between said valves and displaced from the plane of said long axis in a direction opposite to the inclination of said intake valve.

4,401,068

APPARATUS FOR SPLIT ENGINE OPERATION

Robert D. Bristol, P.O. Box 337, Beulah, Mich. 49617

Filed Oct. 23, 1980, Ser. No. 199,818
Int. Cl.³ F02D *9/00*; F02M *13/04*
U.S. Cl. 123—198 F **21 Claims**



1. Apparatus for disabling selected cylinders of a multi-cylinder internal combustion engine of the type including an intake manifold defining a first passage leading to one-half of the cylinders and a second passage leading to the remaining cylinders, and a carburetor secured to said intake manifold for delivering an air/fuel mixture to each of said passages, said apparatus being interposable between said intake manifold and said carburetor and comprising:

a flat base plate defining at least a pair of spaced apertures;

a flat intermediate plate defining a valve element aperture;

at least one flat top plate defining another pair of spaced apertures which are coaxial with said apertures of said base plate, said plates being separate, thin members which are secured together in a stacked, contacting relationship;

a generally planar valve element movably disposed within said intermediate plate valve element aperture and movable between first and second positions, said valve element when in said first position blocking one of said apertures of said base plate and said top plate so that the air/fuel mixture can pass through only said other apertures of said base and top plates to one of said first and second passages thereby to disable selected cylinders, said valve element when in said second position permitting flow through said apertures of said base and top plates; and

actuator means connected to said valve element for shifting said valve element between said first and second positions.

4,401,069

CAMSHAFT LOBES WHICH PROVIDE SELECTIVE CYLINDER CUTOUT OF AN INTERNAL COMBUSTION ENGINE

James E. Foley, WW Ranch, St. R.D. 512, Sebastian, Fla. 32958

Filed Feb. 10, 1981, Ser. No. 233,298
Int. Cl.³ F02D *13/06*
U.S. Cl. 123—198 F **11 Claims**

1. An internal combustion engine, having a plurality of cylinders, comprising:

an axially displaceable cam shaft;

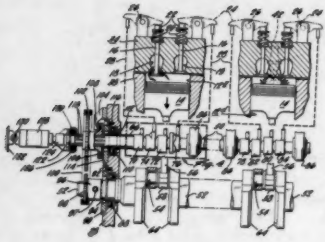
a plurality of cams fixed for rotation together with the cam shaft;

each of the cylinders having an intake and an exhaust valve, each valve being operable by a cam-activated push rod;

at least one, but not all of the cylinders having an intake valve operable by a first multiple lobe cam having at least two push rod activating lobes, one of the lobes having an eccentric circumferential surface relative to the cam shaft axis for periodically opening and closing the intake valve, and the other of the at least two lobes having a sufficiently small radius, throughout its circumference, to prevent the intake valve from opening, and at the same time, having a sufficiently large radius, throughout its circumference, to

nevertheless maintain contact with the push rod, the cam further having a transition surface on which the push rod can easily slide between the lobes;

the exhaust valve of the at least one cylinder being operable by a second multiple lobe cam having at least two push rod activating lobes, one of the lobes having an eccentric circumferential surface relative to the cam shaft axis for periodically opening and closing the exhaust valve, and the other of the at least two lobes having a sufficiently large radius, throughout its circumference, to prevent the exhaust valve from closing, the cam further having a transition surface on which the push rod can easily slide between the lobes;



the remaining cams having at least one push rod activating lobe, the lobes having an eccentric circumferential surface relative to the cam shaft axis for periodically opening and closing the remainder of the intake and exhaust valves, the multiple lobe cams and the remaining cams having substantially equal axial width; and,

the respective lobes of the multiple lobe cams being selectively positionable to engage and activate the push rods through axial displacement of the cam shaft during operation of the engine, whereby the at least one cylinder may be selectively disabled, without interfering with normal operation of the remaining cylinders, to improve gas mileage.

4,401,070

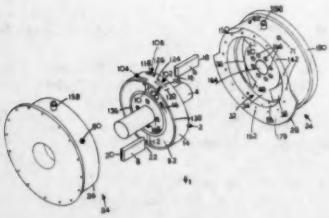
ROTARY ENGINE

James L. McCann, 975 E. Broadway, Vancouver, British Columbia, Canada (V5T 1Y3)

Filed Mar. 31, 1981, Ser. No. 249,620

Int. Cl.³ F02B *53/00, 53/02*

U.S. Cl. 123—229 **5 Claims**



1. An internal combustion engine comprising a stator having a cylindrical hollow with opposite side walls and an annular wall between the side walls; a rotor within the hollow mounted on a shaft, the rotor having side walls adjacent the side walls of the stator; circumferentially extending recesses in the side walls of the stator forming first and second chambers between the rotor and the side wall of the stator on each side of the rotor, the recesses having inclined surfaces which form tapering forward and rear ends of the chambers in the direction of rotation of the rotor, the chambers on one of the side walls of the stator being circumferentially displaced with respect to the chambers of the opposite side wall; vanes in the rotor capable of transverse reciprocation with respect to the direction of rotation of the rotor; intake and exhaust means connected to the recesses, the intake means communicating with each first chamber and the exhaust means communicating with each second chamber; means for transferring compressed air from each first chamber to the second chamber on the same side of the rotor, the means for transferring compressed air comprising conduits in the annular wall of the stator generally between, but not communicating with, the forward end of each first chamber and the rearward end of the second chamber on the same side of the rotor, a first passageway adjacent the rearward side of each vane in the direction of rotation of the rotor on each side of the rotor and a second passageway adjacent the forward side of each vane in the direction of rotation of the rotor on each side of the rotor, the passageways extending between the side walls of the rotor and the annular wall thereof, each first passageway connecting one of the first chambers to one of the conduits when the adjacent vane is near the forward end of the one first chamber, the second passageway on the same side of the rotor as said each first passageway connecting said one conduit to the second chamber on said same side of the rotor when said adjacent vane is near the rear end of the second chamber; and means for releasing the compressed air from the conduits to an exhaust outlet of the exhaust means comprising an exhaust passageway in the stator connected to the exhaust outlet and an opening in the annular wall of the rotorlocated rearwardly of each of the first and second passageways in the direction of rotation of the rotor.

4,401,071

INJECTION AND MIXTURE FORMATION PROCESS AND APPARATUS TO IMPLEMENT SAME

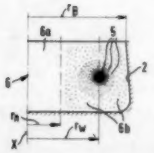
Hans-Jürgen Zürner, Ammerndorf; Wolfram Emmerling, and Werner Steimer, both of Nuremberg, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremburg, Fed. Rep. of Germany

Filed Jan. 7, 1981, Ser. No. 223,123

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003411

Int. Cl.³ F02B *23/06*

U.S. Cl. 123—276 **8 Claims**



1. Process for introducing and mixing combustion air and fuel in air compressing, self-igniting, internal combustion engines having a piston crown formed with a rotation-symmetrical combustion chamber having a substantially flat bottom wall and a circumferential side wall, the inner diameter of said chamber increasing in a direction toward said bottom wall, in which combustion air is caused to be rotated about a longitudinal axis of the combustion chamber, and wherein a cylinder head is provided with a fuel injection nozzle in the region of a rim of the combustion chamber at an angle relative to said longitudinal axis and substantially in the direction of rotation of the combustion air, comprising the steps of injecting at least one spray of fuel into said chamber in the direction of air rotation and, in such a manner, that the individual droplets of fuel in said spray are finely atomized in all operating ranges of the engine and a substantially fuel-free zone is formed at the center of said combustion chamber, the radius of said zone being approximately one-third the radius of said chamber; and

effecting a break-up of said at least one spray in such a manner that the broken-up spray is distributed throughout the zone between said fuel-free zone and said side wall and surrounding said fuel-free zone and generally conforms to the geometry of said side wall of said chamber.

4,401,072

COMBUSTION CHAMBER OF A COMPRESSION-IGNITION TYPE INTERNAL COMBUSTION ENGINE

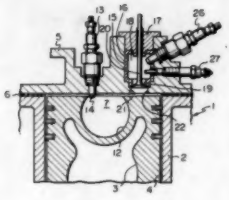
Sumio Ito, Gotenba; Teruo Kumai, Susono; Hisashi Oki, Numazu, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 49,915, Jun. 19, 1979, abandoned. This application Jan. 22, 1981, Ser. No. 227,385

Claims priority, application Japan, Mar. 12, 1979, 54-27607

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—292 **19 Claims**



1. A compression-ignition type internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block and having a cavity therein;

a piston reciprocally movable in said cylinder bore;

a combustion chamber formed between said cylinder head and said piston, said cavity having a port connected to said combustion chamber;

an intake valve movably mounted on said cylinder head for leading air into said combustion chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a fuel supply means arranged in said combustion chamber;

an auxiliary fuel injector arranged in said cavity; and

a valve means for opening said port of the cavity during the compression stroke to spout a jet of gas under pressure into said combustion chamber from said cavity during the first half of the compression stroke, wherein said valve means is opened at a crank angle near a crank angle at which said intake valve is closed, said valve means being closed at a crank angle near a crank angle at which the injecting operation of said fuel supply means is started.

4,401,073

APPARATUS FOR CONTROLLING ROTATIONAL SPEED OF INTERNAL COMBUSTION ENGINE

Shoji Furuhashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 28, 1980, Ser. No. 154,054

Claims priority, application Japan, May 31, 1979, 54-67711

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—339 **16 Claims**

1. An apparatus for controlling the rotational speed of an internal combustion engine mounted on a vehicle, the apparatus comprising:

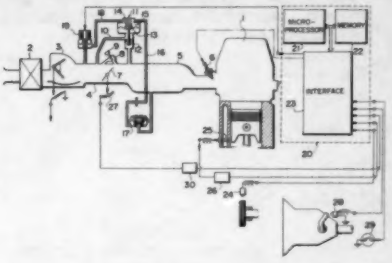
a measuring device for measuring the rotational speed of the engine,

comparing means for producing a deviation signal representative of a deviation between the measured rotational speed and a predetermined desired value,

controlling means for producing a control signal conveying a value in accordance with the deviation signal produced by said comparing means,

regulating means for controlling an amount of intake air entering the engine in accordance with the value of the control signal produced by said controlling means, thus forming a feedback control system for controlling the rotational speed of the engine,

detecting means for detecting a predetermined operating



condition of the engine where all of the following terms are satisfied, that is [1] the position of the transmission connected to the engine is other than neutral, [2] the throttle valve of the engine is closed, [3] the rotational speed of the engine is within a predetermined range, [4] the vehicle speed is under a predetermined speed, and [5] said feedback control system is in operation, and

limiting means for limiting the value of the control signal values less than a predetermined upper limit in the case that the predetermined engine operating condition is detected by said detecting means thereby to restrain an excessive increase of the intake air.

4,401,074

IDLING AIR FLOW RATE ADJUSTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

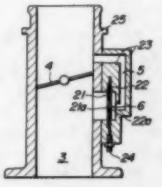
Tomofusa Horiuchi, and Shoichiro Yokota, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 20, 1981, Ser. No. 285,145

Claims priority, application Japan, Jul. 22, 1980, 55/103454[U]

Int. Cl.³ F02M *23/00*

U.S. Cl. 123—339 **6 Claims**



1. An idling air flow rate adjusting device for adjusting the flow rate of idling air in an internal combustion engine of a type which includes an intake air passage, a throttle valve in said intake air passage, and an idling air passage by-passing the throttle valve, said adjusting device being located in the idling air passage and comprising:

variable orifice means comprising a stationary first plate and a movable second plate, each being made of a sheet of material which is sufficiently thin to cause dust and oil particles in the idling air passage which might accumulate

on an orifice-defining surface of said variable orifice means to be separated therefrom by the idling air flow in said idling air passage whereby adjustments of said variable orifice means are less frequently necessary, each of said stationary first plate and said movable second plate defining an opening therein, said movable second plate being in contact with and slidably movable relative to said stationary first plate and so positioned that the openings of each of said plates normally have at least a portion thereof in register to define a variable, effective cross-sectional area of the opening in the stationary first plate; and

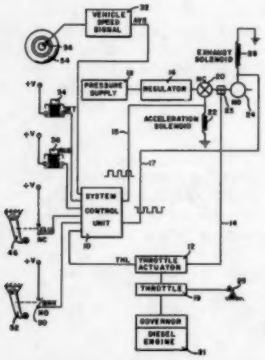
an adjusting member cooperating with said movable plate to move said movable plate relative to said stationary plate to vary the effective cross-sectional area of the opening in the first plate and thereby vary the idling air flow rate in said passage.

4,401,075

AUTOMATIC SPEED CONTROL FOR HEAVY VEHICLES

Patrick J. O'Keefe, Jr., Elyria; Frank R. Schubert, Grafton, and Guy T. Rini, Wellington, all of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 27, 1980, Ser. No. 200,871
Int. Cl.³ B60K *31/00*
U.S. Cl. 123—352 **9 Claims**



1. An automatic speed control system for a vehicle with an engine comprising:

a cruise control means for controlling the speed of the vehicle to an operator-commanded speed when the vehicle is moving by generating a cruise control signal;

a throttle control means for controlling the speed of the engine of the vehicle to an operator-desired speed when the vehicle is stationary by generating a throttle control signal;

a duty cycle translator, responsive to said control signals, for cyclically actuating a pair of electrically actuated valves a varying percentage of time each cycle dependent upon the value of said control signals; and

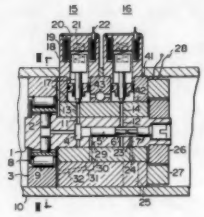
mode control means for switching control of the system between said cruise control means and said throttle control means, wherein said mode control means switches the input of said duty cycle translator between said throttle control signal and said cruise control signal in response to whether the vehicle is moving or stationary.

4,401,076

FUEL INJECTION CONTROL SYSTEM FOR ELECTROMAGNETIC VALVE-CONTROLLED FUEL INJECTION PUMP OF DIESEL ENGINE

Yukinori Sano, Katsuta; Yoshikazu Hoshi, Ibaraki, and Ikuo Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering Co., Ltd., both of Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,028
Claims priority, application Japan, Apr. 20, 1981, 56-58515
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—357 **9 Claims**



1. A control system for controlling the amount of fuel injection and the advance of injection timing for a diesel engine using an injection pump of the type which defines fuel supply period and compression period, alternately, in synchronism with explosion-exhaustion and intake-compression strokes, respectively, of each cylinder of the engine, and includes first and second pressure chambers to be supplied with fuel through first and second electromagnetic valves, respectively, during the fuel supply period, fuel in an amount equal to the amount supplied to said second pressure chamber being injected, during the compression period, into the cylinder at an injection timing determined from the total fuel amount supplied to said first and second pressure chambers, said control system comprising:

first means for determining the amount of fuel to be injected into each cylinder and the advance of injection timing thereof in accordance with the operating conditions of said engine;

second means for opening said second electromagnetic valves for a time interval corresponding to the fuel injection amount determined by said first means;

third means for determining the open time interval of said first electromagnetic valve on the basis of the advance of fuel injection timing and the fuel injection amount determined by said first means;

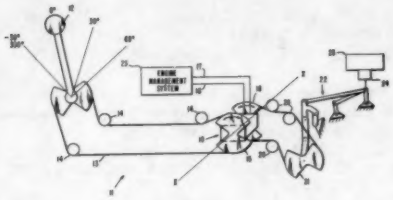
fourth means for determining the delay time of the valve opening start time of said first electromagnetic valve from the opening start time point of said second electromagnetic valve as a function of the open time interval of said second electromagnetic valve corresponding to the fuel injection amount determined by said first means, the open time interval of said first electromagnetic valve determined by said third means and the length of said fuel supply period determined by the engine rotational speed; and

fifth means for starting opening of said first electromagnetic valve with said determined delay time from the opening start time point of said second electromagnetic valve and continuing the opening of said first electromagnetic valve for the time interval determined by said third means.

4,401,077
THROTTLE LINKAGE CONTROL

Robert W. Earl, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 255,088, Apr. 17, 1981, abandoned. This application Jun. 4, 1982, Ser. No. 385,342
Int. Cl.³ F02D 9/00
U.S. Cl. 123—376 **32 Claims**



1. A throttle linkage control for use in a system for controlling the flow of fuel from a source thereof to an engine comprising:

throttle input means rotatable about a throttle axis in response to a preferred fuel flow rate command;

trim input means rotatable about a trim axis in response to a trimming fuel flow rate command for altering said preferred fuel flow rate command;

planet gear means operably associated with said throttle input means and trim input means, said planet gear means being revolvable about a central axis in response to rotation of said throttle input means, and rotatable about a planet axis in response to rotation of said trim input means;

rotatable sun gear mixer means operably associated with said planet gear means and rotatable about a mixer axis in response to revolution or rotation of said planet gear, for combining said preferred and trimming fuel flow rate commands into a single resultant fuel flow rate output command;

rotatable output means, operably associated with said mixer means and the engine, said output means rotatable about an output axis for transmitting said resultant output command to the engine;

fixed cam means for neutralizing the effects of said trimming command upon said resultant output command when said preferred fuel flow rate command is in selected value ranges;

and

movable cam means rotatable about said trim axis to modify the effects of said altering command upon said resultant output command when said preferred fuel flow rate command is in selected value ranges.

4,401,078
INTAKE THROTTLING DEVICE FOR DIESEL ENGINES

Kiyoshi Kato, Hirakata; Yasuo Kondo, Okazaki; Satosi Kuwakado, Aichi, and Nobuhiko Kakeno, Toyota, all of Japan, assignors to Nippon Soken Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 9, 1982, Ser. No. 386,762
Claims priority, application Japan, Jun. 12, 1981, 56-91147
Int. Cl.³ F02D 9/00
U.S. Cl. 123—376 **3 Claims**

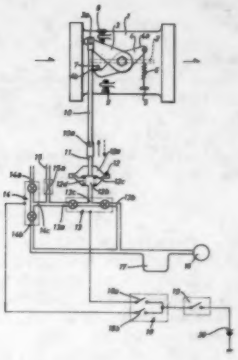
1. An intake throttling device adapted to a Diesel engine, comprising:

an intake pipe for connection to an intake manifold of said engine;

a throttle valve arranged within said intake pipe and fixed to a valve shaft rotatably supported from said intake pipe to rotate in response to the rotational movement of said valve shaft;

an actuator operatively connected to said valve shaft to fully open said throttle valve in its deactivated condition, to adjust the opening angle of said throttle valve suitable for operation of said engine under a low loaded condition in its first activated condition, and to fully close said throttle valve in its second activated condition; and

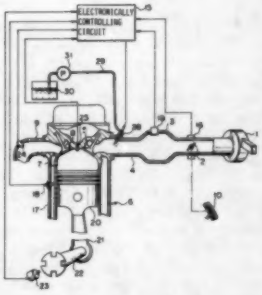
control means for maintaining said actuator in its deactivated condition during normal operation of said engine, for rendering said actuator in its first activated condition during operation of said engine under the low loaded condition and for rendering said actuator in its second activated condition when said engine is arrested or immediately before said engine is arrested.



4,401,079
ELECTRONICALLY CONTROLLED FUEL INJECTION METHOD AND APPARATUS

Keiji Aoki, and Shinji Ikeda, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 5, 1980, Ser. No. 213,334
Claims priority, application Japan, Sep. 5, 1980, 55-122295
Int. Cl.³ F02B 3/00; F02M 7/00
U.S. Cl. 123—435 **10 Claims**



1. A method of electronically controlling the rate of fuel being injected at low engine temperatures into an engine having a combustion chamber and a crank-shaft comprising the steps of:

(a) monitoring a pressure P in said combustion chamber;

(b) determining said P at a plurality of predetermined intervals during compression and explosion strokes from 180° before top dead center to 180° after top dead center;

(c) generating, in response to said determining step, an integrated pressure value Pi related to the integral of the product of P and the incremental change in combustion chamber volume per incremental change in crank-shaft

angle over the range of crank-shaft angles from 180° before top dead center to 180° after top dead center during the compression and explosion strokes;

(d) generating a pumping means effective pressure value P_p related to the difference between combustion chamber pressures during an intake stroke and an exhaust stroke of said engine;

(e) generating a torque value T related to said Pi less Pf and said P_p where Pf is related to a frictional average effective pressure; and

(f) adjusting said fuel injection rate so that T approaches a predetermined optimum torque,

said steps (d), (e) and (f) occurring during one of an exhaust stroke and an intake stroke of said engine,

said steps (c), (d) and (e) being performed by a microcomputer.

4,401,080

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING AIR/FUEL RATIO CONTROL FUNCTION AT ENGINE ACCELERATION

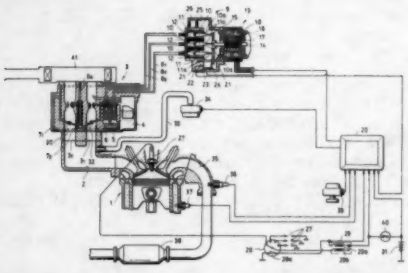
Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1981, Ser. No. 285,310

Claims priority, application Japan, Jul. 25, 1980, 55-102796

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—440 **3 Claims**



1. In an air/fuel ratio control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine, which includes means for detecting the concentration of an exhaust gas ingredient emitted from said engine, fuel quantity adjusting means for producing said mixture being supplied to said engine, and an electrical circuit operatively connecting said concentration detecting means with said fuel quantity adjusting means in a manner effecting feedback control operation in response to an output signal produced by said concentration detecting means to control the air/fuel ratio of said mixture of a preset value, said connecting means including a value having a valve body for varying the air/fuel ratio of said mixture being supplied to said engine, a pulse motor for driving said valve and an electrical circuit for driving said pulse motor in response to said output signal of said concentration detecting means, the combination comprising: means for detecting the rpm of said engine, an acceleration detecting circuit responsive to an output from said engine rpm detecting means for producing a signal indicative of acceleration of said engine when said engine rpm detected by said engine rpm detecting means increases above a predetermined value which is slightly higher than an idle rpm to which said engine is adjusted, means responsive to said acceleration signal to supply driving pulses to said pulse motor so as to cause same to move the valve body of said valve to a preset position which enables to obtain a desired emission characteristic at operation of said engine immediately following said acceleration, means for interrupting the feedback control operation of the air/fuel ratio for a period of time from generation of said acceleration-indicative signal until when said valve moves to said preset position, and means for resuming the feedback control operation of the air/fuel ratio with said preset position of said valve as an initial valve position when said valve moves to said preset position, said acceleration detecting circuit and said driving pulse supply means forming part of said electrical circuit.

4,401,081

METHOD AND APPARATUS FOR CLOSED-LOOP CONTROL OF THE OPERATING MIXTURE COMPOSITION IN AN INTERNAL COMBUSTION ENGINE

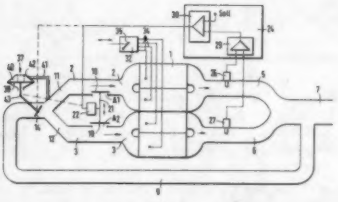
Wolf Wessel, Oberriexingen, and Rainer Buck, Tamm, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 195,963

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941753

Int. Cl.³ F02D *33/00*

U.S. Cl. 123—443 **17 Claims**



1. A method for closed-loop control of the average composition of operating mixtures periodically generated and combusted in an internal combustion engine, which comprises the steps of:

periodically generating, and combusting a first operating mixture and a second operating mixture in the internal combustion engine wherein the composition of the first operating mixture deviates from the composition of the second operating mixture in terms of the air number by a predetermined percentage;

detecting at least one CO exhaust gas measurement of a first CO value of exhaust gas resulting from the combustion of the first operating mixture and a second CO value of exhaust gas resulting from the combustion of the second operating mixture for determining carbon monoxide content of an exhaust gas;

determining, as an actual value, the difference between the first CO value and the second CO value;

comparing the determined actual value with a predetermined set-point value, and, upon deviation of the actual value from the set-point value, generating a corresponding corrective signal; and

varying the compositions of the first and second operating mixtures in accordance with the corrective signal.

4,401,082

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Jean Leblanc, Lyons, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,444

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011831

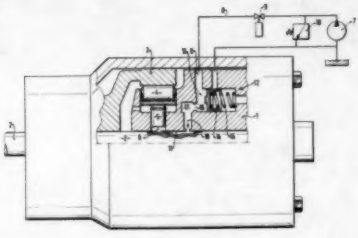
Int. Cl.³ F02M *41/06*

U.S. Cl. 123—447 **7 Claims**

1. In a fuel injection pump for internal combustion engines having a fuel supply, a rotating distributor having a jacket face, a pump housing, at least one pump piston provided in said

pump housing, a pump work chamber partially defined by said pump piston and said pump housing, a fuel supply pump producing a fuel supply output for said pump work chamber, a fuel output quantity being produced by said pump work chamber, a fuel supply conduit having a pressure control valve associated with said fuel supply and said pump work chamber, and at least one control of said supply conduit provided in the jacket face of said rotating distributor to allow fuel to flow to said pump work chamber from said supply conduit, the improvement comprising

a fuel supply reservoir assembly including a reservoir chamber downstream of said pressure control valve and having



a relief conduit to said fuel supply for producing a working pressure, said assembly disposed in said pump housing between said supply conduit and said rotating distributor, whereby a pressure is created in said fuel supply reservoir by said fuel supply, said working pressure being greater than the pressure required by the re-set of said pump piston, and

a spring-biased movable element in said reservoir chamber which is continually pressure relieved and defines an extreme position in which said relief conduit to said fuel supply is opened by said movable element assuming said extreme position against said spring bias, whereby fuel can flow out of said extreme reservoir chamber.

4,401,083

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

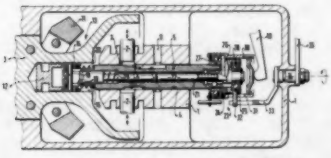
Jean Leblanc, Lyons, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 243,093

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010644

Int. Cl.³ F02M *39/00, 59/20*

U.S. Cl. 123—449 **4 Claims**



1. In a fuel injection pump for internal combustion engines having: means to adjust injection onset; and further means to control an injection quantity, including:

a rotatably and axially displaceable distributor having a jacket face;

a pump drive shaft;

a coupling connected to the distributor and the pump drive shaft; wherein

said pump drive shaft drives said distributor through said coupling;

said further means to control an injection quantity comprising grooves provided in the jacket face of said distributor;

said means to adjust injection onset including: the coupling, guide means disposed in said drive shaft and a coupler ring, whereby relative rotation of said distributor with respect to said drive shaft can be effected, the improvement comprising:

the distributor having a central bore,

a coupler rod received in said bore and cooperating with said coupler ring to displace the latter independently of axial movement of said distributor;

and a stroke device connected to said coupler rod to displace the latter relative to the distributor whereby the injection onset may be adjusted independently of drive shaft rpm,

said stroke device including two rings having axially opposed surfaces,

a first ring having protrusions and a second ring having depressions,

said first ring being connected with the distributor and said second ring being connected with the coupler rod.

4,401,084

FUEL INJECTION PUMPING APPARATUS

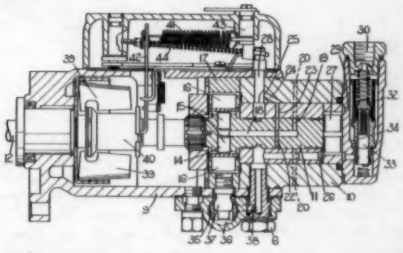
Boaz A. Jarrett, London, and Dorian F. Mowbray, Burnham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 23, 1981, Ser. No. 304,894

Claims priority, application United Kingdom, Nov. 1, 1980, 8035191

Int. Cl.³ F02M *39/00*; F04B *23/10*

U.S. Cl. 123—450 **1 Claim**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising a rotary distributor member carried in a surrounding housing, a pair of pumping plungers housed in respective bores in said distributor member, said bores being interconnected at their inner ends, an annular cam ring surrounding the distributor member, cam lobes on the internal peripheral surface of the cam ring for imparting inward movement to rollers associated with the plungers as the distributor member rotates, delivery passage means through which fuel displaced from the bores during the inward movement of the plungers therein can flow to the associated engine and inlet passage means through which fuel can be supplied to the bores from a source of fuel under pressure, said cam lobes being arranged so that one of said plungers is held against movement while the other plunger partakes of inward movement to cause delivery of fuel by the apparatus, and said cam lobes being arranged to allow said one plunger to move outwardly before the other plunger has completed its inward movement, said cam lobes including pumping lobes and holding lobes, said pumping lobes including leading flanks which impart movement to the rollers and associated plungers engaged therewith, the leading flanks of said pumping lobes terminating at the crests of the lobes, trailing flanks extending from said crests, said trailing flanks of the pumping lobes acting to allow outward movement of the rollers and

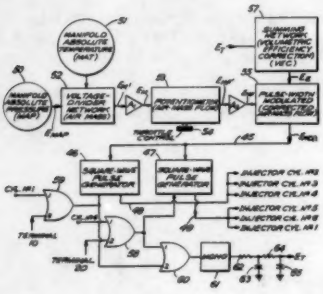
associated plungers for the purpose of pressure reduction in the bores and connected passage means, said holding lobes having crest portions from which extend trailing flanks acting to allow outward movement of the rollers and associated plungers engaged therewith, said holding lobes having leading flanks having a substantially constant profile whereby the rollers and associated plungers engaged therewith will be held against movement, the angular spacing of the crests of the pumping and holding lobes and the angular spacing of the rollers being such that the rollers and associated plungers engaged with the holding lobes can move outwardly slightly before the rollers and associated plungers engaged with the pumping lobes.

4,401,085

SHUT DOWN PROTECTION APPARATUS FOR A WATER COOLED INTERNAL COMBUSTION ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 11, 1981, Ser. No. 329,991
Int. Cl.³ F02M 51/00
U.S. Cl. 123—488 **8 Claims**



1. In an electronic fuel-injection control circuit for a water cooled internal-combustion engine wherein a square-wave pulse generator provides output signals of variable duration, said output signals controlling the fuel flow rate to pistons of said water cooled internal combustion engine, the improvement comprising, means for detecting engine shut down and means responsive to said detecting means for maintaining the generation of said output signals from said square wave pulse generators for a predetermined interval of time after said engine shut down whereby fuel continues to be supplied to the pistons of said internal combustion engine after engine shut down.

4,401,086

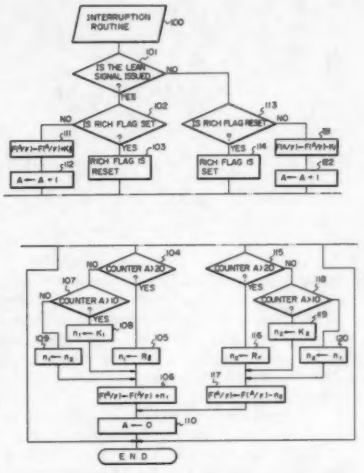
METHOD OF AND APPARATUS FOR CONTROLLING AN AIR RATIO OF THE AIR-FUEL MIXTURE SUPPLIED TO AN INTERNAL COMBUSTION ENGINE

Hideo Miyagi, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1981, Ser. No. 258,572
Claims priority, application Japan, Nov. 7, 1980, 55-155813
Int. Cl.³ F02D 5/00
U.S. Cl. 123—489 **14 Claims**

1. A method of controlling a ratio of the air-fuel mixture fed into cylinders of an internal combustion engine comprising a fuel injector arranged in an intake passage of the engine, an oxygen concentration detector arranged in an exhaust passage of the engine and issuing a rich signal and a lean signal which indicate that the air-fuel ratio of a mixture is on the rich side and on the lean side of the stoichiometric air-fuel ratio, respectively, and an electronic control unit converting the rich signal and the lean signal to an injection control signal having a level which is proportional to the injection time period of the fuel injector, said injection control signal being incrementally increased by a predetermined first value when the signal of the oxygen concentration detector changes from the rich signal to the lean signal, and being incrementally decreased by a predetermined second value which is different from the first value when the signal of the oxygen concentration detector changes from the lean signal to the rich signal, said method comprising the steps of:

detecting a change in the output of the oxygen concentration detector from the rich signal to the lean signal or from the lean signal to the rich signal;



measuring the time elapsed from one change to a next change of said oxygen concentration detector output;

comparing said time elapsed with a predetermined time; and

changing the level of the injection control signal by a value which is equal to a value of the incremental change of said injection control signal in response to the preceding change of the sinal of the oxygen concentration detector when said time elapsed is shorter than said predetermined time.

4,401,087

METHOD AND APPARATUS FOR ENGINE CONTROL

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Kanagawa, Japan

Filed Mar. 31, 1981, Ser. No. 249,743
Claims priority, application Japan, Apr. 3, 1980, 55-42843
Int. Cl.³ F02D 5/02
U.S. Cl. 123—492 **20 Claims**

1. A method for controlling an internal combustion engine, said engine having an output shaft, means for controlling the amount of fuel supplied to said engine, and at least one cylinder adapted to intake, during each intake stroke of said cylinder, fuel supplied in a plurality of installments, said method comprising the steps of:

(a) generating electrical signals indicative of conditions of said engine while said engine is in operation;

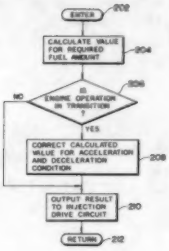
(b) repetitively arithmetically calculating a value corresponding to a setting of said means for controlling the amount of fuel supplied to said engine, said calculation being carried out in a digital computer connected to receive said electrical signals and operable, under program control, for:

(1) arithmetically calculating a basic value from an alge-

braic function describing a desired relationship between said engine conditions and said basic value;

(2) detecting engine acceleration and deceleration conditions from changes in said engine conditions; and

(3) adding a variable value expressed by $K(m_o - X)$ to said calculated basic value to modify said calculated basic value when engine acceleration or deceleration is detected, wherein K is a positive constant, m_o is said calculated basic value, and X is one of (i) a value, m_b, calculated by the preceding calculation made in said step of arithmetically calculating a basic value from an algebraic function describing a desired relationship between said engine conditions and said basic value; and (ii) a



value, M_b, calculated by the preceding calculation made in said step of calculating a value corresponding to a setting of said means for controlling the amount of fuel supplied to said engine;

(c) converting said calculated setting value into a setting of said means for controlling the amount of fuel supplied to said engine; and

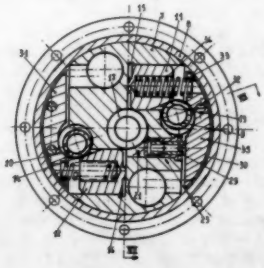
(d) while said engine is in operation, continuously repeating the above sequence of steps at uniform angular intervals of rotation of said engine output shaft to effect changes in the settings of said means for controlling the amount of fuel supplied to said engine in response to changes in said electrical signals indicative of said engine conditions.

4,401,088

BUILT-IN HYDRAULIC AUTOMATIC DEVICE FOR ADVANCING THE INJECTION OF A DIESEL ENGINE

Rene Morin, Pelussin, France, assignor to Renault Vehicules Industriels, Rhone, France

Filed Dec. 28, 1979, Ser. No. 107,882
Claims priority, application France, Dec. 29, 1978, 78 37109
Int. Cl.³ F16D 5/00; F02M 59/20
U.S. Cl. 123—502 **10 Claims**



1. An automatic hydraulic fluid device for advancing the fuel injection pump of a diesel engine in response to engine speed, said engine having a drive pinion and injection pump having a camshaft, with a central axis, said device comprising:

a hub member coaxially mounted to the camshaft of the injection pump for rotation therewith, said hub having portions defining at least one cavity with a central axis oriented perpendicular to the central axis of the camshaft, at least one passage communicating with said at least one cavity, an annular passage centrally located in said hub member and a second cavity with a central axis parallel to said central axis of said at least one cavity and further communicating with said annular passage, said at least one passage having an inlet and an outlet;

a casing member mounted to the drive pinion for rotation therewith;

at least one roller member connected to said casing member, said at least one roller member having an axis oriented parallel but spaced away from the central axis of the camshaft and further being mounted within said at least one passage, said at least one roller member having an outer diameter smaller than said inner diameter of said at least one passage to permit relative movement of said casing member to said hub member;

at least one piston member slidably mounted within said at least one cavity, said at least one piston member having a front face; a rear face opposite to said front face; a biasing ramp on the periphery of said at least one piston member adjacent to said front face; and a central axis projecting from said rear face to said front face, said biasing ramp of said at least one piston member further being located contiguous to said at least one roller member for cooperative engagement therewith, said rear face of said at least one piston member and the bottom of said at least one cavity defining at least one pressure chamber; and

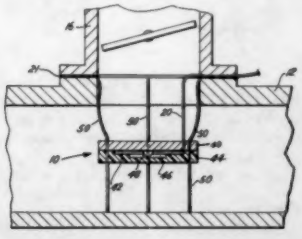
means, mounted in said second cavity, for supplying pressurized fluid to said at least one pressure chamber in response to the drive pinion gear rotational speed such that above a predetermined rotational speed of said drive pinion, the pressurized fluid in said at least one pressure chamber forces said at least one piston member in said at least one cavity to move outward from said axis of the camshaft toward said casing member whereby said biasing ramp of said piston member moves against said at least one roller member to move said hub member relative to said casing member to cause an angular displacement therebetween in order to advance the fuel injection pump of said diesel engine.

4,401,089

ULTRASONIC TRANSDUCER

Gabor Csaszar, Cary; Fred M. Goldman, Glenview; Gernot Oehley, Chicago, and Edward J. Svoboda, Hinsdale, all of Ill., assignors to Midas International Corporation, Chicago, Ill., a part interest

Filed Feb. 9, 1981, Ser. No. 232,693
Int. Cl.³ F02M 29/00
U.S. Cl. 123—536 **15 Claims**



1. For use in an internal combustion engine having a carburetion means connected to an engine intake manifold, the

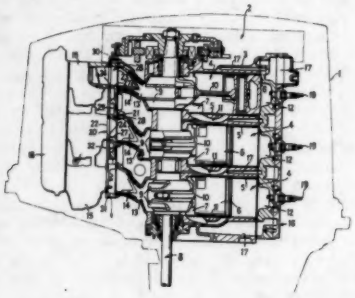
improvement comprising an ultrasonic transducer for vaporizing the fuel disposed substantially at the hot spot in the engine intake manifold, said transducer comprising a crystal adapted to be vibrated at a high frequency on the order of at least 1,000,000 Hz and a resonator tuned to the frequency of the crystal and operatively connected to the crystal, said resonator having an active surface adapted to be contacted by the fuel for finely vaporizing same for better mixture with the air from the carburetion means, whereby the internal combustion engine will deliver more power, while reducing carbon monoxide and hydrocarbon emissions, and saving fuel, and mounting means for supporting the ultrasonic transducer inside the engine intake manifold between an opening thereto through which the fuel/air mixture passes from the carburetion means and the hot spot of the engine intake manifold without any alteration of the engine intake manifold or engine specifications.

4,401,090

INTERNAL COMBUSTION ENGINE WITH HEATED INTAKE SYSTEM

Hiroaki Fujimoto, and Kyoji Hakamata, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 30, 1981, Ser. No. 249,144
Claims priority, application Japan, Apr. 4, 1980, 55-44339
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—545 **8 Claims**



1. In an internal combustion engine having a cylinder, a carburetor, said carburetor having a heat-conductive metal wall, a throttle in said carburetor, an intake passage for receiving fuel/air mixture from said carburetor and conducting it to said cylinder, said intake passage having a heat-conductive metal wall, means to resist icing of said carburetor and condensation of fuel from said mixture, comprising: heater chamber means surrounding a portion of said intake passage so as to heat said metal wall, said chamber means being adapted to contain fluid at an elevated temperature whereby to heat the inside wall of said intake passage, said metal walls of said carburetor and of said intake passage being physically connected in heat-conductive relationship, whereby heating of said intake passage wall also heats said carburetor wall.

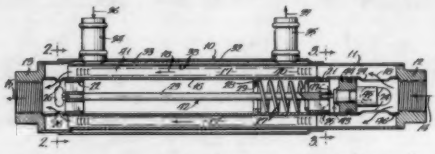
4,401,091

TEMPERATURE CONTROLLED FUEL HEATER

Norman F. Costello, and Dennis C. Granetzke, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Jul. 24, 1981, Ser. No. 286,568
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **14 Claims**

1. A fuel heater, comprising a source of fuel:
passage means for said fuel through said heater;
heated means;
valve means movable between a first position and a second position, said valve means at said first position directing substantially all said fuel through a first path in heat receiving relationship with said heated means and at said second position directing substantially all said fuel through a second path away from said heated means; and



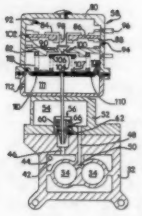
movable temperature responsive means responsive to the temperature of said fuel in said heater for moving said valve means between said first and second positions, said valve means directing portions of said fuel through both said paths when between said positions.

4,401,092

EXHAUST GAS RECIRCULATION SYSTEM

Shane H. Rachedi, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 29, 1981, Ser. No. 287,846
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **2 Claims**



1. An exhaust gas recirculation (EGR) system for use with an internal combustion engine having intake and exhaust manifolds and a pressure sensing port in the exhaust manifold for sensing the pressure changes therein, the system comprising;
an EGR duct connecting the gases from the exhaust manifold to the engine intake manifold, and a one-piece integral assembly of a spring closed sonic flow EGR valve means in the duct normally closing the duct to prevent recirculation of gases and movable to open positions in response to fluid pressure acting thereon, and a fluid pressure actuated servo means connected to the valve means for moving the valve means in response to the application of fluid pressure thereto,
the servo means comprising a housing having first and second annular flexible diaphragms and a central partition dividing the housing into first and second parts on opposite sides of the partition, the first part containing an exhaust gas backpressure chamber and a first ambient air pressure chamber on opposite sides of the first diaphragm, the second part containing a control vacuum chamber and a second ambient air pressure chamber on opposite sides of the second diaphragm, means connecting a source of vacuum at constant pressure level to the vacuum chamber for effecting a movement of the second diaphragm, means connecting the second diaphragm to the EGR valve means, and means connecting the exhaust gas backpressure chamber to the exhaust manifold pressure port for controlling the movement of the first diaphragm as a function of the change in exhaust gas backpressure,
the control vacuum chamber having an air bleed valve assembly operably associated therewith and connected to the first diaphragm to bleed the control vacuum at times in

response to exhaust backpressure changes, the assembly including an air vent and an air bleed valve movably associated with the vent to control flow through the same, a part of the assembly being movable with the first diaphragm to control the bleed of air into the vacuum chamber to control the movement of the EGR valve means by the air pressure in the second air chamber as a function of the changes in exhaust backpressure and control vacuum, the partition having a hole therein connecting the first air chamber and the control vacuum chamber and constituting the vent at times receiving the bleed valve therein to close the vent in response to a predetermined movement of the first diaphragm in response to exhaust gas backpressure acting thereon to increase the pressure differential between the air pressure in the second air chamber and the control vacuum to thereby move the EGR valve,

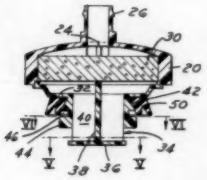
the EGR valve means consisting of an essentially conical pintle mounted for a reciprocating movement into and out of a stationary cooperatively shaped nozzle to define convergent-divergent flow paths at all open positions of the pintle for the flow of exhaust gases therethrough, the valve means being so designed and constructed to provide sonic flow through the valve means over essentially the entire vacuum operating level of the engine to thereby establish a constant rate of flow of exhaust gases through the valve means at each open position of the valve means, the rates of flow through the valve means thereby varying solely as a function of the area opening of the valve means as determined by the position of the pintle in response to the change in control vacuum level controlling the fluid pressure level acting on the servo means and being independent of the pressure level changes downstream of the valve means.

4,401,093

OIL FILL/AIR BREATHER CAP WITH INTEGRAL OIL SEPARATOR

Freeman C. Gates, Jr., Southfield, and Egils A. Purins, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 9, 1982, Ser. No. 386,565
Int. Cl.³ F01M *13/00*
U.S. Cl. 123—573 **5 Claims**



1. An oil fill/air breather cap for use with an automotive type internal combustion engine having an air cleaner comprising:

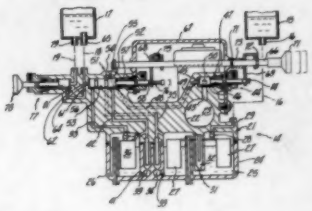
a hollow one-piece closed housing adapted to be inserted into an opening of an engine through which oil and air may be added and through which oil laden crankcase vapors from the engine may flow in a reverse direction out of the engine toward the air cleaner, the housing containing an oil filter and oil separator means on the engine side of the filter in axial alignment therewith, the oil separator means having baffle means inhibiting the flow of oil droplets from the crankcase to the filter, and tube means connecting the housing on the air cleaner side of the filter to the air cleaner for the normal flow of clean air from the air cleaner through the filter and oil separator to the crankcase.

4,401,094

STARTING SYSTEM OF CARBURETORS FOR MULTIPLE KINDS OF FUELS

Shuzaburo Shimmura, Shizuoka; Tokuichi Hakamata, Hamamatsu, and Masahiro Takemoto, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 13, 1981, Ser. No. 253,378
Claims priority, application Japan, Apr. 12, 1980, 55-52857; Apr. 23, 1980, 55-48277
Int. Cl.³ F02B *1/00*
U.S. Cl. 123—576 **11 Claims**



1. A multi-fuel system for an internal combustion engine having a first source of fuel for normal engine running, a second fuel source for cold starting, charge forming means for supplying a fuel air charge to the engine, cold starting enrichment means for providing cold starting enrichment from said charge forming means to the engine, and valve means moveable between an opened position and a closed position for controlling the communication between said second fuel source and said cold starting enrichment means, the improvement comprising said cold start enrichment means having a normal position, a first position and an enrichment position, means for moving said valve means between its opened position and its closed position in response to movement of said cold starting enrichment means from its enrichment position to its first position and for maintaining said valve means in its closed position when said cold start enrichment means is in its normal position, and change-over valve means selectively communicating said second fuel source with said cold starting enrichment means when said change-over valve means is in a first position or said first fuel source with said cold starting enrichment means when said change-over valve means is in a second position.

4,401,095

FUEL-AIR MIXING DEVICE

Walter A. DuLoft, Ft. Walton Beach, Fla., assignor to Taylor C. Miller, Jr., Montgomery, Ala.

Filed Feb. 24, 1981, Ser. No. 237,841
Int. Cl.³ F02M *29/00*
U.S. Cl. 123—590 **17 Claims**

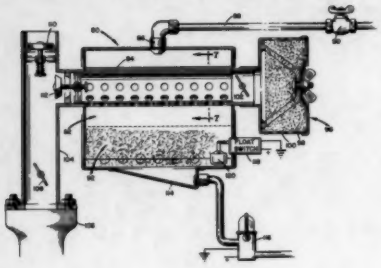
1. Apparatus for mixing a vaporizable fuel and a gaseous oxidizer, comprising:

a housing defining a mixing chamber;

fuel inlet means formed in the housing for feeding fuel into the chamber;

a shroud mounted within the mixing chamber, the shroud comprising an inverted, U-shaped structural element having opposed leg portions and an arcuate bight portion connecting upper edge portions of the leg portions, lower edge portions of the leg portions extending downwardly into spaced relation with lower floor portions of the chamber, the shroud extending throughout the chamber to separate the chamber into a first volumetric portion lying above and along outer surfaces of the shroud and a second volumetric portion lying within the confines of the shroud and bounded by inner surfaces of the shroud, the first and second volumetric portions communicating through openings formed between said lower edge por-

tions of the leg portions and the lower floor portions of the chamber, the fuel inlet means directing liquid fuel onto upper and outer portions of the shroud to facilitate vaporization thereof, the vaporized fuel mixing with air present in the first volumetric portion of the chamber and moving downwardly within the chamber and through the openings and into the second volumetric portion;



air feed means carried by the housing for feeding gaseous oxidizer into the chamber and into mixing relation with the fuel vaporizing within the chamber, the fuel being further vaporized by mixing with the gaseous oxidizer thus delivered into the chamber; and

means communicating with the interior of the chamber and carried by the housing for ducting mixed fuel vapors and gaseous oxidizer from the chamber.

4,401,096

MAGNETO IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

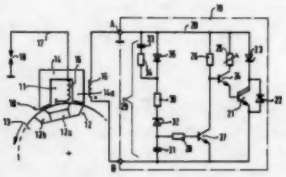
Jiri Podrapsky, Rosstal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,255

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201534

Int. Cl.³ F02P *1/00*

U.S. Cl. 123—631 **7 Claims**



1. Magneto ignition system for an internal combustion engine having a spark gap,

said system including

an ignition coil system having

a primary winding (15);

two terminals (A, B) on the primary winding;

a secondary winding (16);

an armature core (14, 14*a*) and a rotating magnet (12) coupled to rotate with the engine;

an electronic switch (21) connected to interrupt current flow through the primary winding at an ignition instant;

an electronic control circuit (29) coupled to the primary winding and connected to control conduction or blocking of the electronic switch (21) and having

a control switch (27);

a first R/C series timing circuit (30, 31) connected to said control switch (27) and across the primary winding,

a Zener diode serially connected in said first R/C series circuit,

and a second series R/C circuit (34, 33) to modify the conduction characteristic of the first timing circuit and provide a change of timing instant as a function of frequency of voltages induced in the primary winding, and hence provide for speed-dependent ignition advance, said timing circuits controlling said control switch (27);

and comprising, in accordance with the invention,

means for insuring operation of the engine in a predetermined direction only including

a diode (35) connected in parallel to the second timing circuit (34, 33), the diode (35) being poled in a direction opposite to the polarization of the Zener diode (32);

and wherein the second timing circuit (34, 33) has one of its terminals connected to that one of terminals (A) of the primary winding (15) which, at the ignition instant, has a voltage which is high with respect to the other terminal (B) thereof.

4,401,097

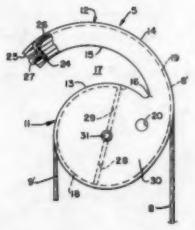
COMPOUND BOW WITH OVER-LAPPING TRACK CAMS

Gary Simonds, Gainesville, Fla., and Arnold D. McKee, Hartford, Ill., assignors to Victor United, Inc., Chicago, Ill.

Filed Jun. 22, 1981, Ser. No. 275,626

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—23 R **21 Claims**



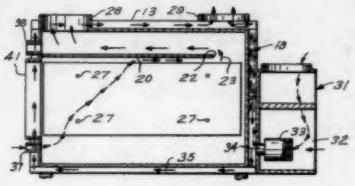
1. In a compound bow including a handle, upper and lower limbs extending from said handle and each having a tip, pivot support means mounted adjacent each said limb tip, a cam member eccentrically mounted for pivotal displacement upon each said pivot support means, a bowstring spanning and engaging said two cam members, a pair of tension cables, each said tension cable having a cam portion engaging one said cam member and an opposite anchor portion secured adjacent an opposite one said cam member, the improvment comprising, said cam members each including a main body section provided with an outer curved periphery, said main body section having an eccentrically disposed bore engageable with said pivot support means, a hook section extending away from said main body section and provided with an outer periphery, each said cam member main body section and hook section disposed in a common vertical plane, a track in both said main body and said hook section peripheries, said bowstring having opposite end portions respectively disposed in said hook section tracks of said two cam members, and said tension cable cam portions respectively disposed in said main body tracks of said two cam members.

4,401,098

WOOD BY-PASS FURNACE

Peter S. Stephenson, Sr., Stinesville, Ind., and Ellis D. Stephenson, heir, 913 S. 19th St., Chesterton, Ind. 46304

Filed Apr. 8, 1981, Ser. No. 252,201
Int. Cl.³ F24C 1/14
U.S. Cl. 126—61 3 Claims



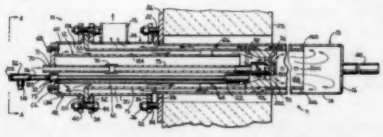
1. A wood by-pass furnace, comprising: a horizontal housing; a horizontal fire chamber secured in said housing for receiving wood to be burned, said fire chamber being positioned in said housing to provide passageway means between the bottom, top, sides, and front and rear ends of the fire chamber and the housing; a door on the front of the housing for introducing wood into the fire chamber; a horizontal baffle plate secured to the fire chamber in spaced relation to the top thereof, said baffle plate defining passageway means in the fire chamber and acting to deflect and direct heated air rearwardly and then forwardly in the fire chamber, and, further to delay the exit of heated air and smoke from the fire chamber; a pair of opposed plates secured in overlying relation to the sides of the fire chamber for shielding the sides of the fire chamber from hot ashes in the fire chamber; a draft air box secured to the rear of the housing for directing cool air into the passageway means at the rear and the bottom of the furnace; controlled air intake means at the front of the housing for directing unheated air into the fire chamber to support burning of wood in the fire chamber; a smoke outlet pipe at the front of the furnace in communication with the passageway means in the fire chamber defined by the horizontal baffle plate; and heated air outlet means at the rear of the furnace in communication with the passageway means between the top of the fire chamber and the housing.

4,401,099

SINGLE-ENDED RECUPERATIVE RADIANT TUBE ASSEMBLY AND METHOD

David W. Collier, Cannock, England, assignor to W.B. Combustion, Inc., Hales Corner, Wis.

Filed Jul. 11, 1980, Ser. No. 167,413
Int. Cl.³ F24C 3/00
U.S. Cl. 126—91 A 23 Claims



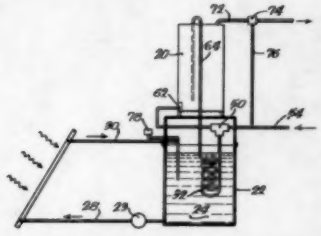
1. A single-ended recuperative radiant tube assembly, comprising: a burner, fuel means connected to said burner for feeding fuel to said burner, air means connected to said burner for feeding air to said burner and mixing with said fuel, exhaust means for receiving hot exhaust gases from said burner including a flame tube positioned downstream of said burner, said exhaust means defining an exhaust chamber operatively positioned adjacent and cooperating with said air means for heating the air in said air means before said air reaches said burner, and means for shielding said fuel means for protecting said fuel means from overheating, said air means and said burner together defining an annular, non-converging air passage, said burner including a plurality of turbulence inducing fins extending radially across said annular, non-converging air passage to said air means for creating swirling airflow, said burner further including at least one generally radially extending discharge opening through which fuel flows into the central portion of said swirling airflow, said discharge opening being closely associated with said turbulence inducing fins for enhancing progressive combustion by said burner within said flame tube.

4,401,100

WATER HEATING SYSTEM

Harold E. Slater, 12822 Beechtree, Lakeside, Calif. 92040, and Thomas R. Alspaugh, 4707 Otomi Ave., San Diego, Calif. 92117

Filed May 4, 1981, Ser. No. 259,988
Int. Cl.³ F24H 1/00; F24J 3/02
U.S. Cl. 126—362 19 Claims



1. Apparatus for heating water, comprising a first tank having an inlet, an outlet and a drain; a second tank for containing a supply of heat transfer fluid, said second tank being disposed below said first tank; means for connecting the heat transfer fluid in said second tank with a source of energy to heat the fluid; a heat exchanger disposed in said second tank, said heat exchanger having an inlet and an outlet and said outlet being connected to said first tank inlet; and valve means having a first inlet for connection with a supply of fresh water, a second inlet connected with said first tank drain and an outlet connected with said heat exchanger inlet, said valve means being responsive to withdrawal of water from said first tank outlet to interrupt a path between its second inlet and its outlet and to establish a path between its first inlet and its outlet for a flow of water from the supply thereof through said valve means and heat exchanger to said first tank inlet, said heat exchanger heating the water prior to its introduction into said first tank, and said valve means being responsive, in the absence of withdrawal of water from said first tank outlet and to a sufficient temperature of the heat transfer fluid in said second tank, to interrupt a path between its first inlet and its outlet and to establish a path between its second inlet and its outlet for recirculation of water by thermal syphon effect from said first tank drain through said valve means and heat exchanger to said first tank inlet to heat the water in said first tank.

4,401,101

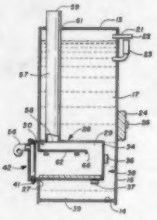
WOOD-FIRED BOILER AND STORAGE SYSTEM

Martin R. Lunde, 2608 37th Ave. North, Minneapolis, Minn. 55421

Continuation-in-part of Ser. No. 211,778, Dec. 1, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,766
Int. Cl.³ F24B 9/00
U.S. Cl. 126—367 23 Claims

1. A combination solid-fuel-burning liquid heating and thermal energy storage apparatus for storing heated liquid for the heating of room spaces and other uses during intervals between intermittent burnings of successive fuel loads, said apparatus comprising a storage tank of substantial capacity having top,

bottom, and side tank wall portions for containing a large volume of liquid to be heated and stored between such intermittent burnings, the side wall portion having a single firebox opening therein spaced above the bottom tank wall portion, a liquid-tight firebox within said tank having one open end in liquid-tight engagement with the tank wall portion around the firebox opening and having a main body portion with top, bottom and side firebox wall portions and a firebox end wall portion opposite the open end, means supporting the firebox at a level within the tank for substantially complete immersion of the firebox top, bottom, side and opposite end wall portions, at all times during such intermittent burnings, within the liquid to be heated and stored within the tank, means constantly venting the top of said storage tank to ambient pressure outside the tank, an open stack member extending from the firebox through the expected liquid in the tank, said stack member having an inlet opening communicating with the interior of the



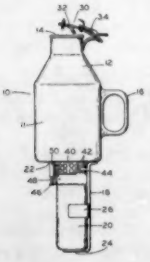
firebox, an outlet opening outside of the tank for discharging gaseous combustion products from the firebox, and an intermediate portion extending through the liquid in said tank, one tank wall portion having an outlet opening for the stack member with the stack member extending outwardly through said opening, the stack member and wall portion having means permitting expansion and contraction of the stack member blower means for providing a draft of combustion air into the firebox opening and a forced discharge of the gaseous combustion products from the firebox and through said stack throughout the burning of each intermittent fuel load thereby minimizing incomplete combustion of such fuel and the deposit of solid fuel residues within the firebox and stack, and heat transfer means including at least a hot liquid outlet connection to said tank for transferring stored thermal energy from the heated liquid in the tank for the heating of said room spaces and other uses.

4,401,102

FLY TACKLE STEAMER

Jerald A. Bovino, 5339 Brooklawn, Toledo, Ohio 43623, and Joseph A. Bovino, 218-10 68th Ave., Bayside, N.Y. 11364

Filed Apr. 20, 1981, Ser. No. 255,689
Int. Cl.³ F24D 1/00
U.S. Cl. 126—369 **12 Claims**



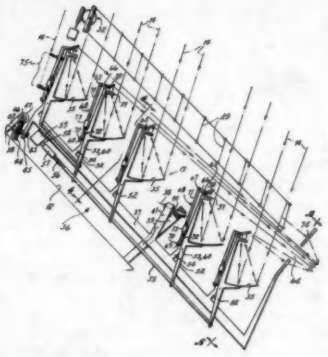
1. An apparatus for steam treatment of fishing flies comprising a water containing vessel having an upwardly opening mouth, means adjacent said mouth for retaining the hackle portion of a fishing fly over said mouth, and resilient clamping means attached to said vessel for retaining a removable heat source in a predetermined spaced relationship to the bottom surface of said vessel.

4,401,103

SOLAR ENERGY CONVERSION APPARATUS

Hugh A. Thompson, 5777 Windermere La., Fairfield, Ohio 45014

Filed Apr. 28, 1980, Ser. No. 144,669
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 **13 Claims**



8. A solar energy conversion system for a dwelling having a roof, the system comprising,

a small target for receiving concentrated solar energy and located close to said dwelling,

a storage system close to said target for receiving and storing heat transmitted from said target in the form of a hot fluid,

said target including means for converting radiant energy impinging on said target to a hot fluid, means for directing said fluid to said storage system, said fluid giving up its heat to said storage system,

an array of individual collector units mounted on the roof of said dwelling,

each collector unit having a first receiving element causing the sun's rays to converge, a second element adjacent said first element for receiving said converging rays and forming a narrow beam of substantially parallel rays, a third element adjacent said second element for directing said beam to said target, and means for moving said third element relative to said first element,

means for rotating each said collector unit individually about two axes perpendicular to each other to track the sun as it moves substantially from horizon to horizon,

a louvered screen covering said collector array for temporarily shutting said system down, and means for normally maintaining said louvers parallel to the sun's rays.

4,401,104

THERMAL GAIN SENSOR

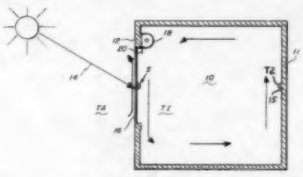
James A. Kuzdrall, Box 1247, Nashua, N.H. 03061

Filed Feb. 19, 1981, Ser. No. 236,121
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 **48 Claims**

1. An apparatus for sensing the direction of net energy flow through a fluid-separation barrier which is transparent to radiant energy traveling from a source on one side of the barrier to a fluid-filled space on the other side of the barrier, the apparatus comprising:

means for defining a thin space that is filled with a thermally conductive means and is of such width as to simulate the convective heat transfer from said fluid-filled space to the barrier, said thin space-defining means comprising a radiant energy absorbing surface that forms one side of said thin space, is thermally insulated from said fluid-filled space, and simulates the radiant absorbency of said fluid-filled space,

means for mounting said thin space-defining means to the barrier with the barrier itself forming the other side of said



thin space thereby simulating the thermal loss due to conduction through the barrier and convection outside the barrier,

a first temperature sensing means for detecting the temperature of said radiant energy absorbing surface,

a second temperature sensing means for detecting the temperature of said fluid-filled space, and

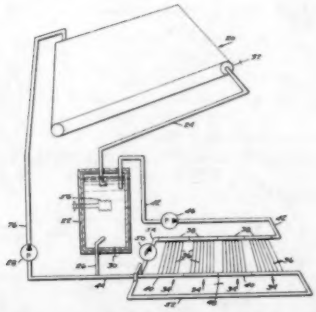
means responsive to said first and second temperature sensing means for producing a control signal indicating net thermal gain when said first temperature is greater than said second temperature.

4,401,105

SOLAR HEATING SYSTEM, AND IMPROVED HEAT COLLECTING AND RADIATING COMPONENTS, FOR LIVESTOCK-CONFINING BUILDINGS

Roy E. McAlister, 5285 N. Red Rock Dr., Phoenix, Ariz. 85018

Filed Sep. 23, 1981, Ser. No. 304,877
Int. Cl.³ F24J 3/02
U.S. Cl. 126—422 **1 Claim**



1. A system for heating a building adapted to confine animals comprising:

at least one heat radiating floor mat adapted to have heated water circulated therethrough and to be installed on the floor of the building, said mat comprising a plurality of parallel tubes having their axes in a common plane and inlet and outlet headers connected respectively to the opposite ends of said tubes;

a solar collector adapted to heat water circulated therethrough and to be mounted exteriorly of the building for optimum exposure to solar radiation, said collector comprising a plurality of parallel tubes having their axes in a common plane and inlet and outlet headers connected respectively to the opposite ends of said tubes;

a storage tank for heated water;

first conduit means connecting said collector outlet header with the top portion of said tank;

second conduit means connecting said collector inlet header with the lower portion of said tank;

third conduit means connecting said mat inlet header with said tank;

fourth conduit means connecting said mat outlet header with said second conduit means adjacent said tank;

first pump means connected into said third conduit means for withdrawing heated water from said tank and circulating it through said floor mat;

second pump means connected into said second conduit means for withdrawing water from one of said tank and said mat, depending on whether said first pump means is operating, and circulating it through said solar collector;

means responsive to a predetermined temperature adjacent said mat controlling said first pump means for operating the same to maintain said predetermined temperature; and

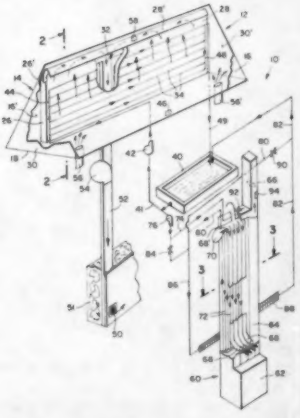
means responsive to a positive temperature differential between the water in said collector outlet header and the water in said tank lower portion for operating said second pump means whenever the water temperature in said collector outlet header exceeds the water temperature in said tank lower portion.

4,401,106

SOLAR AND STANDBY FIREPLACE SYSTEM

Tihamer S. Binner, 304 West Point Ave., Somerset, N.J. 08873

Filed Jun. 15, 1981, Ser. No. 273,432
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **5 Claims**



1. A solar energy heating unit comprising, in combination, a V-shaped housing made of clear material, said V-shaped housing having a first side panel and a second side panel, and a base portion connecting first ends of said first and second side panels; an insulating layer means positioned within said housing perpendicular to said base portion extending from said base portion toward the vertex of said housing, said insulating layer extending along most of the length of said housing; a reflecting layer means adjacent to said insulating layer means for reflecting light rays from the sun; water pipe means within said housing, said water pipe means being heated by the ambient air within the housing to thereby heat the water therein, wherein said insulating layer means comprises a channel formed midway along the length thereof and extending downwardly in a direction from said vertex of said housing toward said base

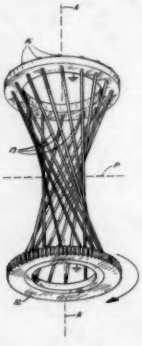
portion, said channel serving as an air duct for directing heated air downwardly to a room of a house, wherein said reflecting layer means is in abutting relationship to said insulating layer means and attached thereto, said reflecting layer means covering said channel along the length of said channel, said reflecting layer means extending upwardly beyond said channel toward said vertex and said insulating layer means having an upper portion thereof of reduced width and which is affixed to near said vertex, said reduced portion of said insulating layer means and the portion of said reflecting layer means defining therebetween a space for directing heated air into said channel.

4,401,107

INTESTINAL CONTROL VALVE

Terry M. Haber, 25011 Castlewood, Lake Forest, Calif. 92630, and William H. Smedley, 25371 Pacifica, Mission Viejo, Calif. 92691

Filed Apr. 20, 1982, Ser. No. 370,099
Int. Cl.³ A61F *1/00*
U.S. Cl. 128—1 R **9 Claims**



1. An intestinal control valve for surrounding the anal-terminating descending intestine of a patient for realizing continence, said valve including in combination:

(a) an upper stationary ring;

(b) a lower rotatable ring in an axially aligned position with said stationary ring;

(c) a plurality of rods extending from said lower rotatable ring through aligned openings in said upper stationary ring in directions parallel to and spaced a given radial distance from the axis of the rings when the rotatable ring is in a first position; and

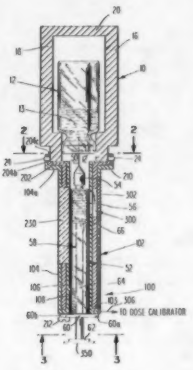
(d) a toroidal member having an inner flexible part extending between the rings surrounding the anal-terminating descending intestine with the rods passing externally of the flexible part and an outer rigid part passing externally around the rings and rods whereby rotation of said rotatable ring within said toroidal member through a given angle to a second position twists the rods to decrease the given radial distance of the centers of the rods from the axis of the rings to thereby radially contract said flexible part to controllably reduce the passage through the anal-terminating descending intestine.

4,401,108

RADIOACTIVE MATERIAL LOADING, CALIBRATION AND INJECTION SYSTEMS

Benjamin M. Galkin, Cherry Hill, N.J.; Raymond Boon, Glenolden, Pa.; Rudolph V. Gilliam, Yeadon, Pa., and Chan H. Park, Ambler, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 121,211, Feb. 13, 1980, Pat. No. 4,307,713. This application May 29, 1981, Ser. No. 268,273
Int. Cl.³ A61N *5/12*
U.S. Cl. 128—1.1 **18 Claims**



1. An apparatus for loading, dose calibrating and injecting radioactive materials for use with a multi-dose vial for storing said materials and a syringe for withdrawing said materials from said vial and for injecting said materials into a patient, comprising:

(a) syringe shield means for receiving and shielding a syringe contained therein;

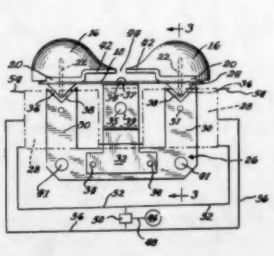
(b) mouth shield means coupleable to said syringe shield means and configured to at least engage said dosage vial for shielding at least the mouth of said vial during withdrawal of said materials from said vial, said mouth shield means comprising a radiation detector.

4,401,109

VIBRATORY MASSAGE DEVICE

Peter G. DeJong, Grand Rapids, Mich., assignor to General International Corporation, Glenview, Ill.

Filed Mar. 30, 1981, Ser. No. 248,952
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—41 **5 Claims**



1. In a vibratory massage device comprising a casing, a flat spring member which carries magnetically attractable masses adjacent opposed ends thereof, and electromagnetic means for

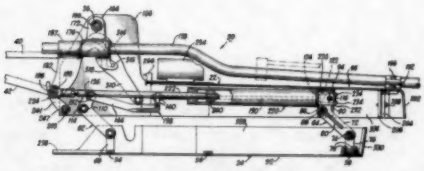
said vibrating spring member and masses, the improvement comprising, in combination:

said electromagnetic means comprising an integral core piece having a pair of parallel arms and being of generally U-shape, and a pair of electrically connected coils, each coil being mounted on separate, parallel arms, said parallel arms defining free ends generally V-shaped in cross section, said magnetically attractable masses including mating members positioned to magnetically interact with said free ends and of a shape to fit in mating relation with said free ends, said U-shaped core piece carrying a structural member positioned between the parallel arms, said structural member being attached to and carrying said spring member at a central position thereof, said structural member being substantially a non-participant in the pulsating magnetic circuit, and of less thickness than the parallel arms, said magnetically attractable masses each including ferromagnetic plate members carried on said flat spring member, said plate members extending ends into closely spaced proximity to each other to strengthen the magnetic circuit extending between them, each plate member defining a step portion to increase the air gap between the step portions and the top of the structural member.

4,401,110
PATIENT TREATMENT TABLE

Carl R. Ekholm, Elgin, Ill., assignor to Standex International Corporation, Salem, N.H.

Filed Aug. 12, 1980, Ser. No. 177,427
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—70 **24 Claims**



1. A patient treatment table, comprising a support frame, an upper frame, a patient table pivotally mounted on said upper frame and having an offset arm portion, a cylinder and piston assembly having relatively movable portions one of which is the piston portion of said assembly and the other of which is the cylinder portion of said assembly, means connecting one of said movable portions of said assembly to said offset arm portion, means for introducing fluid under pressure into one end of said cylinder to lower said patient table from a tilted position near the vertical into engagement with said upper frame, said engagement of said patient table with said upper frame preventing further movement of said one movable portion upon the continued application of fluid under pressure to said one end of said cylinder, and means responsive to movement of the other movable portion of said assembly upon the continued application of fluid under pressure to said one end of said cylinder after engagement of said patient table with said upper frame for elevating both said patient table and said upper frame relative to said support frame.

4,401,111
CERVICAL SPINE COLLAR

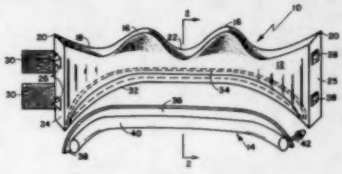
Ralf W. Blackstone, 4678 Barker Way, Long Beach, Calif. 90814

Filed Oct. 28, 1980, Ser. No. 201,425
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **5 Claims**

1. A cervical spine collar providing head and neck stabilization relative to the upper spine of a victim having possible cervical spine injury comprising;

(a) an elongated superstructure, said superstructure being substantially planar, longitudinally flexible, latitudinally rigid and adapted to be closely positioned about a human neck;

(b) a fastening means located upon the longitudinal ends of said superstructure for fastening said longitudinal ends to each other, said fastening means and said superstructure adapted to facilitate location of said fastening means at the anterior face of said neck when said collar is positioned about said neck; wherein said fastening means comprises: pyramidal protrusions and securing straps located on a first end of said superstructure; and pyramidal recesses



and securing grips located on a second end of said superstructure, said protrusions and said recess cooperating to hold said collar in proper lateral alignment while said securing straps cooperate with said securing grips to secure said collar longitudinally about on said neck of said victim;

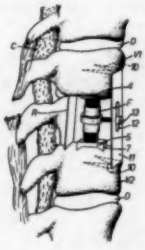
(c) a superior surface of said superstructure contoured to closely fit about the lower portion of a human head to prevent movement of said head; and

(d) an inferior surface of said superstructure contoured to closely fit about the shoulder area of a human upper torso to prevent substantial movement of said superstructure.

4,401,112
SPINAL FIXATOR

Seyed M. Rezaian, The Hotel Isola Garni, Niesenweg 10, CH 3012 Bern, Switzerland

Filed Oct. 2, 1981, Ser. No. 308,016
Int. Cl.³ A61F *5/04*; A61B *17/18*
U.S. Cl. 128—92 B **14 Claims**



5. A prosthetic spinal fixator for insertion between the lower face of a first vertebra portion and the upper face of a second vertebral portion that is below the first one comprising:

jacking means, composed of material suitable for bone surgery, for insertion directly between said upper and lower faces,

said jacking means having an upper end for engaging said lower face and a lower end for engaging said upper face and a rigid intermediate section adjustable to rigidly vary the distance between said upper and lower ends for thereby decompressing the spinal cord and setting the distance between said first and second vertebral portions,

said upper and lower ends having spike means for penetrating their complementary faces and each of said ends also

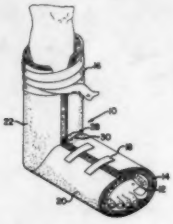
having a surface that will be flush with its complementary face over a substantial area, said jacking means also having a height about equal to the height of a vertebral portion.

4,401,113

SPONGE SPLINT COMPRESSION DRESSING

Anthony I. Incorvaia, 5659 Melvin St., Pittsburgh, Pa. 15217

Filed Sep. 14, 1981, Ser. No. 302,038
Int. Cl.³ A61L *15/00*
U.S. Cl. 128—156 **4 Claims**



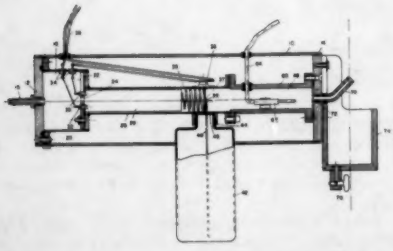
1. A combination splint-compression dressing for an injured ankle or foot comprising a preformed two layer sheet, the inner layer being a regenerated, open celled, swellable, cellulose sponge of about one-half inch and the outer layer being a nonwoven resin impregnated web of organic fibers of about one-quarter inch thick bonded to said inner layer, said dressing being formed with a foot section to foldably cover the foot area, an ankle section joined to the foot section through a tapered connecting section and a foldable section to cover the ankle area and overlap the foot area, said dressing being bendable in the area of the connecting section so as to permit the ankle section to bend at substantially right angles to the foot section.

4,401,114

APPARATUS FOR HEATING OF THE NASAL PASSAGES

Andre Lwoff, Paris, France; Aharon Yerushalmi; Irun R. Cohen, both of Rehovot, Israel, and Gideon B. Moshe, Rishon Le Zion, Israel, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 930,182, Aug. 1, 1978, abandoned. This application Apr. 8, 1981, Ser. No. 252,263
Claims priority, application Israel, Sep. 8, 1977, 52690; United Kingdom, Aug. 4, 1978, 32263/78; Fed. Rep. of Germany, Aug. 8, 1978, 2834622; Japan, Aug. 8, 1978, 53/96563; France, Sep. 8, 1978, 78 23409
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.14 **7 Claims**



1. Apparatus for the treatment of the common cold or allergic rhinitis comprising:

controllable apparatus located in a first enclosure for providing a stream of heated pressurized gas;

means for humidifying the stream of gas for providing a stream of heated and humidified gas including water droplets having an average droplet size of 4–8 microns;

means for governing the temperature of said heated and humidified stream of gas to maintain the temperature at 43 degrees centigrade plus or minus 0.5 degrees centigrade;

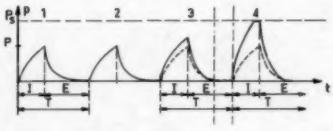
means having an outlet for directing an unconfined volume of said heated and humidified gas around the nasal mucosa of a patient without requiring inhalation by the patient; and means for maintaining an unconfined minimum separation of 1 cm between said outlet and the nostrils of a patient.

4,401,115

RESPIRATOR APPLIANCES

Jean-Pierre Monnier, Maurepas, France, assignor to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed May 22, 1981, Ser. No. 266,480
Claims priority, application France, Jun. 10, 1980, 80 12824
Int. Cl.³ A61M *15/00*
U.S. Cl. 128—204.23 **9 Claims**

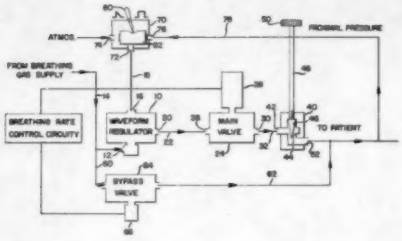


1. In a respirator for the artificial ventilation of the pulmonary tracts of a user in accordance with a cycle of inhalation and exhalation stages of the kind comprising supply circuit means delivering a breathable gas, utilisation circuit means including an inhalation branch and an exhalation branch provided with an exhalation valve, breathable gas accumulator means communicating with said supply and utilisation circuit means and forming a reserve buffer of said breathable gas, distributor means connected to said supply circuit means and comprising an inhalation valve in communication with said inhalation branch for selectively admitting said breathable gas thereto, an accumulator valve and a non-return valve both of which are disposed between the inhalation valve and said accumulator, a cyclic action control device which controls said inhalation valve, said exhalation valve, and said accumulator valve according to a predetermined programme and which is arranged to direct the breathable gas coming from the supply circuit means and from the accumulator means towards said inhalation branch during the inhalation stages, and to direct the breathable gas coming from said supply circuit means towards said accumulator during the exhalation stages; the improvement comprising, in combination with the foregoing, auxiliary makeup circuit means for supplying a complement of breathable gas to the utilisation circuit means, discharge circuit means for selectively withdrawing a part of the breathable gas in advance of said utilisation circuit, and ventilation corrector circuit means sensing changes in pressure in said inhalation branch and responsive to the durations of the inhalation and exhalation stages to alter such durations accordingly, with said ventilation corrector circuit means acting on said auxiliary makeup circuit means and said discharge circuit means to cause such means to make up or to withdraw said breathable air in dependence upon said changes in pressure and changes in said durations.

4,401,116
GAS FLOW RATE CONTROL DEVICE FOR MEDICAL VENTILATOR

Stanley E. Fry, and Claude C. Hurd, both of Riverside, Calif., assignors to Bear Medical Systems, Inc., Riverside, Calif.

Filed Dec. 4, 1980, Ser. No. 212,893
Int. Cl.³ A61M 16/00
U.S. Cl. 128—205.24 9 Claims



1. In a medical lung ventilator for delivering breathing gas to a patient at a controlled rate of flow, an improved gas flow rate control apparatus, comprising:

first means for selecting a peak flow rate; and

second means in fluid communication with said first means, for selectably (a) substantially maintaining the flow rate at least at said peak flow rate as said patient's airway proximal pressure increases and (b) allowing said flow rate to decay from said peak flow rate at a selected decay rate as said patient's airway proximal pressure increases.

4,401,117
THERAPEUTIC APPLIANCE

Hyman Gershuny, 70 Highland Ave., Newport, Vt. 05855

Filed Feb. 23, 1981, Ser. No. 236,707
Int. Cl.³ A61M 15/08; A62B 23/06
U.S. Cl. 128—206.11 2 Claims

1. A therapeutic appliance useful as a nasal filter comprising:

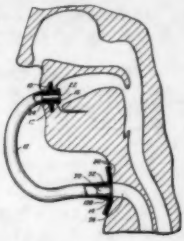
a substantially rectangular strip of material capable of trapping air-borne pollutants, said material having a stronger material backing, said material being rolled into a substantially cylindrical shape to be held in the nostril of a user, the volume of said shape being substantially filled by said material so that substantially all of the air passing through the nose of the user will pass through said material, the springiness of the material enhancing its ability to stay in said nostril; and

particles of gas adsorbent material interspersed within said material to retard and prevent the passage of outside noxious gases through and beyond the nasal passages into the bronchial tubes and lungs.

4,401,118
SWIMMING APPARATUS

Elliot Simons, 51 Broad Reach, #M-53A, and Robert Boulos, 51 Broad Reach, #T-64A, both of North Weymouth, Mass. 02191

Filed May 28, 1981, Ser. No. 267,690
Int. Cl.³ A61M 16/00
U.S. Cl. 128—207.14 12 Claims

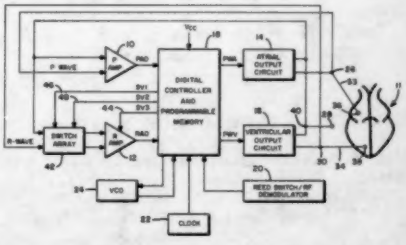


1. A swimming apparatus used to enable a person having a laryngectomy or the like to safely swim, said apparatus comprising; an elongated unobstructed air tube, a mouthpiece means at one end of the air tube having an air passage communicating with the air tube to enable air passage between the air tube and person's mouth, a relatively flat sealing member having means forming a water tight seal about the throat stoma, said tube and said sealing member being absent of any structure to intrude into the throat stoma, said sealing member also having an air passage, means securing the other end of the air tube to the sealing member enabling air passage between the air tube and person's throat, and means holding the sealing member in water tight sealing relationship to the throat about the throat stoma, said means holding the sealing member comprising fastening means for holding the sealing member in a water tight position about the throat stoma and including means supplying some downward force for holding the sealing member properly sealed, whereby the person controls air flow in alternate directions corresponding to inhalation and exhalation through the air tube by interaction of the mouth and mouthpiece.

4,401,119
PROLONGATION OF TIMING INTERVALS IN RESPONSE TO ECTOPIC HEART BEATS IN ATRIAL AND VENTRICULAR PACEMAKERS

Lodewijk-Jozef Herpers, Kerkrade-West, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 17, 1981, Ser. No. 235,232
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 40 Claims



1. A pulse generator for selectively delivering stimulating pulses to the heart in an atrial synchronous mode of operation comprising:

atrial sensing means for sensing atrial contractions of the heart and providing an atrial sense signal;

ventricular sense amplifier means for sensing ventricular contractions of the heart and providing a ventricular sense signal;

ventricular pulse providing means for providing ventricular stimulating pulses in response to an atrial sense signal;

timing means responsive to a ventricular sense signal for providing a disabling signal for disabling said ventricular sense amplifier means for a first interval following the ventricular sense signal and for providing a further timing signal for controlling the operation of the pulse generator; and

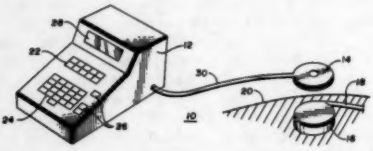
means responsive to a ventricular sense signal present at the termination of said first interval for suspending operation of said timing means to prolong the time interval of said further timing signal until said ventricular sense signal substantially dissipates.

4,401,120

DIGITAL CARDIAC PACEMAKER WITH PROGRAM ACCEPTANCE INDICATOR

Jerome T. Hartlaub, New Brighton, and Ray S. McDonald, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 91,278, Nov. 5, 1979, abandoned, which is a continuation of Ser. No. 957,961, Nov. 6, 1978, abandoned.
This application Aug. 12, 1981, Ser. No. 292,066
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PT **41 Claims**



1. A programmable implantable medical device comprising:

program storage means for accepting and storing a programming signal remotely applied thereto which influences the operating conditions of the medical device;

means for providing periodic treatment to the body under conditions established by the stored programming signals and in the absence of normal body function during a predetermined time period;

means for sensing normal body function and affecting the operation of said periodic treatment providing means; and

program acceptance indicating means responsive to the acceptance by said program storage means of a programming signal for causing a program acceptance signal to be provided by said periodic treatment means in synchronism with a sensed normal body function, said program acceptance signal having characteristics that may be detected remotely to indicate that said program storage means has accepted and stored a programming signal.

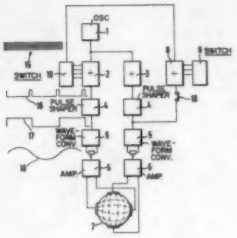
4,401,121

DEVICE FOR TREATMENT WITH INTERFERENCE CURRENTS

Hans Rodler, Graz-Neuhart, Austria, assignor to Firma Somartec S.A., Geneva, Switzerland

Division of Ser. No. 3,961, Jan. 16, 1979, Pat. No. 4,280,504.
This application Feb. 5, 1981, Ser. No. 231,921
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—420 A **7 Claims**

1. In a device for providing electromedical treatment by causing a plurality of signals to be applied by electrode means to a body, said signals being of relatively different frequencies to interfere with one another in the body to be treated, including first means for generating a first relatively high frequency signal in the form of a pulse train; and second means, coupled to said first means and providing an output to said electrode means, for dividing said relatively high frequency signal into a plurality of relatively lower frequency signals that differ in frequency by a difference frequency, the improvement comprising:



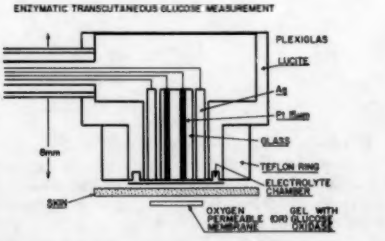
means for controllably varying the division of said relatively high frequency signal to one of said relatively lower frequency signals, including means for selectively adding one or more pulses to the pulse train of said relatively high frequency signal and causing the resulting pulse sequence to be controllably divided to a lower frequency signal.

4,401,122

CUTANEOUS METHODS OF MEASURING BODY SUBSTANCES

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed Aug. 2, 1979, Ser. No. 63,159
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **37 Claims**



1. A non-invasive cutaneous method of analyzing body substrates in the body which comprises

contacting in the body of non-gaseous body substrate with an enzyme selected for the substrate being analyzed,

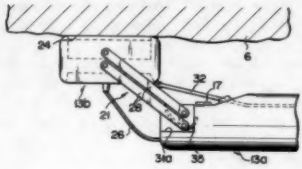
reacting the substrate with the enzyme, and

detecting a condition of the skin without invading the body at the time of the detection as a measure of the amount of substrate in the body.

4,401,123
ENDOSCOPE HAVING AN ULTRASONIC DIAGNOSIS FUNCTION

Kazuo Baba, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,298
Claims priority, application Japan, May 9, 1980, 55-61346
Int. Cl.³ A61B *1/06, 10/00*
U.S. Cl. 128—660 **11 Claims**

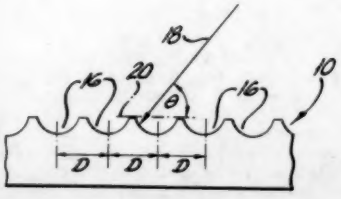


1. An endoscope having an ultrasonic diagnosis function, comprising:
a control section for controlling operations of the endoscope;
a distal end; and
a flexible tube connecting said control section and said distal end; said distal end including:
an observing portion coupled to said flexible tube, said observing portion having a first axis, and being provided with a view window and an illumination window formed on one surface thereof substantially in parallel with said first axis;
an ultrasonic wave emitting-receiving portion located adjacent to said observing portion and having a second axis substantially in parallel with and selectively aligned with said first axis and provided with an ultrasonic oscillator having an ultrasonic wave emitting and receiving plane substantially in parallel with said view window and said second axis; and
a mechanism coupled to said observing portion and to said ultrasonic wave emitting-receiving portion for moving said ultrasonic wave emitting-receiving portion relative to said observing portion such that said second axis is moved away from but substantially in parallel with said first axis and for keeping said ultrasonic wave emitting-receiving plane substantially parallel with said view window.

4,401,124
REFLECTION ENHANCEMENT OF A BIOPSY NEEDLE

Joe F. Guess; Dennis R. Dietz, both of Littleton, and Charles F. Hottinger, Englewood, all of Colo., assignors to Technicare Corporation, Solon, Ohio

Filed Aug. 13, 1981, Ser. No. 292,470
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **14 Claims**

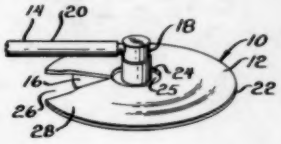


1. Apparatus for performing surgical procedures upon select, internal body tissues, comprising:
(a) a pulse-echo ultrasound imaging system for imaging the area of the body including said tissues, said imaging system including transducer means adapted to be accoustically coupled to the exterior of the body; and
(b) surgical instrument means for insertion into the body for performing said surgical procedures, said surgical instrument means having a surface A comprising a diffraction grating for enhancing the reflection coefficient of the surgical instrument means.

4,401,125
STETHOSCOPE SECURING PAD

Rebecca S. Taylor, Mundelein, and John A. Pavlo, Hanover Park, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Sep. 21, 1981, Ser. No. 304,395
Int. Cl.³ A61B *7/02*
U.S. Cl. 128—715 **7 Claims**



1. A securing pad, comprising:
a stethoscope having a head for contacting a a patient's skin; and
a generally annular sheet of flexible material larger than the head and having a circular outer edge larger than said head, a circular inner edge defining an opening smaller than the head of the stethoscope, a slot extending from the outer edge to the inner edge, a back surface, a front surface, and adhesive on the front surface of the sheet, said stethoscope being passed through said slot to position the head in said opening.

4,401,126
ENDOCARDIAL, IMPLANTABLE LEAD FOR PACEMAKER

Bertil Reenstierna, Borgeby 11, S-230 50 Bjärred, Sweden

PCT No. PCT/SE80/00170, § 371 Date Feb. 13, 1981, § 102(e) Date Feb. 13, 1981, PCT Pub. No. WO80/02801, PCT Pub. Date Dec. 24, 1980
PCT Filed Jun. 13, 1980, Ser. No. 237,157
Int. Cl.³ A61N *1/04*
U.S. Cl. 178—784 **11 Claims**

1. An endocardial, implantable lead for connection with an implantable pacemaker, said lead comprising
a predetermined portion of the lead (1) including
a helical coil portion (8),
and a curved portion (9) connected to said helical coil portion,
an electrical conductor (3) in the lead in said predetermined portion,
at least one electrode (5) connected to said electrical conductor and on said curved portion in a position adapted for contact with the inner wall of a heart auricle to trans-

fer stimulating pulses to the heart or collect heart pulses from the heart,

said curved portion being biased in its curved shape to bear against the inner wall of the heart auricle along a substantial portion of its length where said at least one electrode is located,

said helical coil portion having a helical shape rising in the longitudinal direction of the lead to form an open coil in a manner to absorb compressive forces exerted on either side of the general plane of said coil portion.

4,401,127

STABLE ELECTRODES FOR ENDOCARDIAL PACING

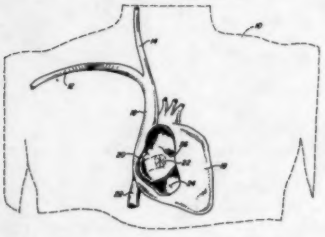
Philip O. Littleford, 251 Salvador Sq., Winter Park, Fla. 32789

Continuation-in-part of Ser. No. 168,742, Jul. 14, 1980, Pat. No. 4,357,947. This application Feb. 3, 1981, Ser. No. 231,130

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 **12 Claims**



1. A pacing electrode for insertion through a puncture wound into a patient's body for providing an electronic stimulus to the patient's heart, said electrode comprising:

a flexible conductor having an outer insulating sheath, said sheath and conductor including proximal and distal ends, a body portion and distal portion, said distal portion extending into a lateral direction away from the axial direction of said body portion;

a conductive terminal at the end of said distal portion of said conductor for electrical connection within the heart;

means along said body portion at the proximal end of said conductor for indicating said lateral direction of said distal portion;

means adjacent the proximal end of said sheath for interconnecting a pacemaker pulse generator to said conductor; and wherein

said distal end of said conductor is inserted into the heart with the proximal end and said indicating means extending outside of said puncture wound, whereby said distal portion may be located in a desired position by manipulation of said proximal end and said indicating means after insertion of said distal end into the patient's heart, said indicating means comprising a wing joined to said sheath adjacent said proximal end, said wing extending away from said conductor in a fixed relation to the lateral direction of said distal portion.

4,401,128

GRAIN LOSS REDUCTION KIT

Hollis G. Fisher, Rte. 2, Box 233, Mulberry, Ark. 72947

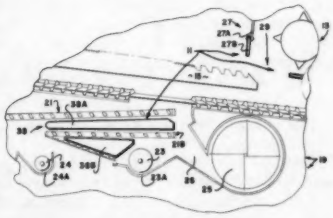
Filed Oct. 26, 1981, Ser. No. 314,759

Int. Cl.³ A01F *12/00*

U.S. Cl. 130—27 R **2 Claims**

1. A grain saving kit adapted to be installed upon a combine harvester of the type having cylinder thresher means establishing an initial stage for partially segregating grain from the straw and chaff, oscillating straw walker means establishing a subsequent stage for further separating grain from the straw and chaff, grain/tailings conveyor means disposed adjacent said cylinder thresher means and said straw walker means for receiving the partially segregated grain as it leaves said clyinder thresher means and said walker means, grain cleaning means disposed adjacent said grain/tailings conveyor means for receiving the grain and tailings therefrom and to establish a final stage for removing substantially all of the unthreshed material from the grain, said grain cleaning means having sieve means for readily passing only the clean grain onto clean grain conveyor means, and air blower means directed toward said sieve means for primarily establishing a moving air mass which entrainingly conveys the unthreshed material to a tailings discharge section, the kit comprising:

means for periodically establishing a drop slot through which the fine chaff and grain may readily gravitate onto said grain/tailings conveyor means, said drop slot being disposed between said cylinder thresher means and said straw walker means to enable an abundance of the residue of comingled chaff and grain rejected by said cylinder thresher means to immediately enter onto said grain/tailings conveyor means; said means for periodically establishing a drop slot comprising:



transfer plate means situated between said cylinder thresher means and said straw walker means for cooperative action with said straw walker means, said transfer plate means having a slotted rearward edge for encouraging separation of grain from chaff, the transfer plate defining at least in part said drop slot as said straw walker means is caused to shakingly oscillate a given distance toward and away from said rearward edge of said transfer plate means; and,

rigid, planar baffle plate means disposed generally vertically above said drop slot; and,

air confinement means interposed adjacent said grain cleaning means and said conveyor means for insuring even distribution of the air mass as it moves in the immediate vicinity of said sieve means, whereby to attenuate the likelihood of grain kernels inadvertently becoming entrained along with the unthreshed material, and for compensating for material build-up otherwise occuring on inclined surfaces, thus enhancing the grain separation effectiveness of said straw walker means and the grain distribution said combine.

4,401,129

COMB AND CUT BATON

Fortino C. Luque, 8471 Suva, Downey, Calif. 90240

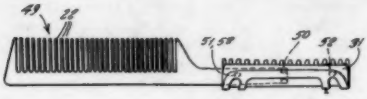
Filed Sep. 8, 1981, Ser. No. 299,818

Int. Cl.³ A45D *24/36*

U.S. Cl. 132—45 R **1 Claim**

1. A comb and cut baton, comprising, in combination, a comb member and a razor on said comb member; said comb member including a row of teeth, each alternate one of which is relatively thin, while each tooth therebetween is relatively thick, and said comb member having an elongated handle at one end; said razor including a single edge razor blade replaceably held in an opening formed along said handle, and a razor guard slidably fitted around said handle; said razor guard

having a serrated edge held in juxtaposition with a cutting edge of said blade, so as to form a first lip on one side of said razor blade, a second lip member for positioning adjacent on opposite side of said blade, a plurality of transverse slots on said second lip member for selective alignment with a plurality of



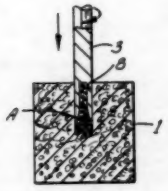
toothed, diagonal slots on said razor guard, and a knurlled bar alongside said second lip member, and a plurality of snap pins formed on said bar being received in said transverse and diagonal slots for securement of said second lip member on said razor guard in selected position.

4,401,130

SWAB ARTICLE

George C. Halford, Chardon, and John E. Goodrich, Mentor, both of Ohio, assignors to Halbrand, Inc., Willoughby, Ohio

Filed Feb. 9, 1978, Ser. No. 876,464
Int. Cl.³ A45D *40/30*
U.S. Cl. 132—88.5 9 Claims



1. The method of forming a bore having a cushioned bottom in a polyester foam body which comprises, rotating and penetrating into the body, a hollow interior boring tool having a cylindrical exterior surface and a sharp edge extremity formed by an inwardly tapered section extending into the hollow interior, whereby to sever the material from the body to form a cylindrical bore whilst the severed material remains connected to the body in advance of said edge, gathering the material severed inwardly into the interior aforesaid and twisting the material as the bore is formed, the severed material remaining connected to the body.

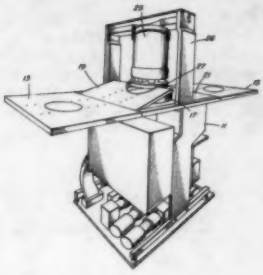
4,401,131

APPARATUS FOR CLEANING SEMICONDUCTOR WAFERS

Robert M. Lawson, San Jose, Calif., assignor to GCA Corporation, Bedford, Mass.

Filed May 15, 1981, Ser. No. 264,097
Int. Cl.³ B08B *3/12*
U.S. Cl. 134—149 11 Claims

1. Apparatus for cleaning semiconductor wafers comprising:
a chuck for holding a semiconductor wafer to be cleaned;
above and aligned with said chuck, an ultrasonic transducer provided with a faceplate which fully overlies a wafer held in the chuck;
drive means interconnecting said chuck and said transducer for bringing a wafer held in the chuck into face-to-face, closely spaced proximity to said transducer and for rotating the wafer during cleaning;
means including an aperture in said faceplate for introducing a liquid into the gap between the wafer and the faceplate; and
means for energizing said transducer to provide an essentially uniform acoustic field over said faceplate, said faceplate being flat over the majority of the surface facing the



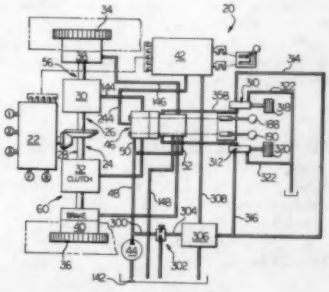
wafer but including also a plurality of grooves facilitating the venting of vapors created by cavitation during cleaning.

4,401,132

VEHICLE STEERING BRAKE AND CLUTCH CONTROL

Gary A. Hakes, North Brunswick, N.J.; Norma G. Shook, Morton; George W. Cackley, Hanna City, both of Ill.; Stephen D. Burdette, Edina, Minn., and Hugh C. Morris, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 29,823, Apr. 13, 1979, abandoned, which is a division of Ser. No. 876,581, Feb. 9, 1978, Pat. No. 4,246,992, which is a division of Ser. No. 688,798, May 21, 1976, Pat. No. 4,093,048. This application Oct. 17, 1980, Ser. No. 198,182
Int. Cl.³ F16D *67/04*
U.S. Cl. 137—1 2 Claims



1. A method of actuating a valve including a valve body and first and second spools mounted in a common bore defined by the valve body, and an actuator means for moving the first and second spools, which actuator means is located in the common bore between the first and second spools, and which actuator means includes a first and a second plunger, one of which plungers being connected to one of the spools by a first spring, the other of which plungers being connected to the other of the spools by a second spring, and a third spring interconnecting the plungers, comprising moving the actuator means in one direction to move the first plunger into contact with a portion of the valve body against the resiliency of one of the springs to provide movement of the first and second valving spools to respective first positions, and moving the actuator means in another direction to move the second plunger relative to the valve body against the resilience of one of the other springs to

provide movement of the first and second valving spools to respective second positions.

4,401,133

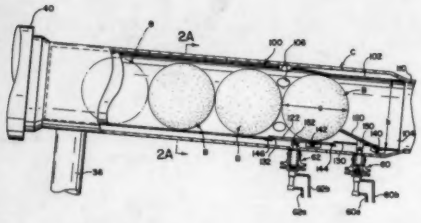
DEVICE FOR LAUNCHING SPHERICAL PIGS INTO A PIPELINE

Robert J. Lankston, Shawnee, Kans., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 28, 1981, Ser. No. 268,058

Int. Cl.³ B08B 9/04

U.S. Cl. 137—268 **20 Claims**



1. In a device adapted to be connected at a given location to a pipeline for launching general spherical pigs into said pipeline, said device including an elongated barrel secured to said pipeline and having a forward end for passage of a pig from said barrel and an escapement means for allowing passage of a pig from said barrel to said pipeline at said given location, the improvement comprising: an elongated pig receptacle having an opened end and adapted to be telescopically moved into said barrel to an inserted position with said opened end at said forward end of said barrel; and, means for releaseably securing said receptacle in said inserted position, and wherein said escapement means including a first member carried by said receptacle and movable between an inwardly extended pig blocking position and a retracted pig passage position, a second member fixed on said barrel and movable selectively between a first pig blocking position and a second pig passage position and interconnecting means for drivingly connecting said first and second members when said receptacle is in said inserted position in said barrel.

4,401,134

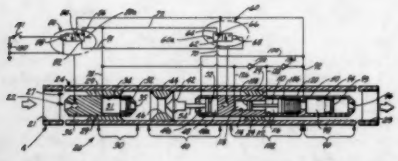
PILOT VALVE INITIATED MUD PULSE TELEMETRY SYSTEM

Patrick E. Dailey, Torrance, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 5, 1981, Ser. No. 240,875

Int. Cl.³ F16K 31/124

U.S. Cl. 137—624.11 **8 Claims**



1. A pulser for mud flowing in a conduit, comprising:

a reservoir for fluid, separate from the mud, operative when positioned in such flow of mud for imparting energy from the mud to the separate fluid therein;

hydraulically operated valve means adapted for insertion in such flow of mud displaced from the fluid reservoir and comprising an actuation chamber for fluid separate from the mud;

a fluid operated control valve coupled between the fluid reservoir and the actuation chamber and having a control port;

an electrically controllable valve coupled between the fluid reservoir and the control port,

the electrically controllable valve being operative in response to a first electrical signal applied thereto for providing communication in the separate fluid between the fluid reservoir and the control port to thereby allow energy in the flow of mud to be applied through the separate fluid to the control port, the electrically controllable valve being operative in response to a second electrical signal condition for blocking the separate fluid communication between the fluid reservoir and the control port,

the control valve being responsive to the energy transferred in the separate fluid to the control port when communication is established by the electrically controlled valve and the blocking of such communication for assuming a first condition wherein communication between the fluid reservoir and the actuation chamber through the separate fluid is blocked and a second condition for providing communication in the separate fluid between the fluid reservoir and the actuation chamber, the second condition thereby allowing energy in the flow of mud to be applied through the separate fluid to the actuation chamber,

the hydraulically operated valve means being responsive to the energy applied to the actuation chamber for creating a change in the restriction of such flow of mud to thereby initiate a pressure pulse in the flow of mud; and

a further reservoir for fluid, separate from the mud, operative when positioned in such flow of mud for imparting energy from the mud to the separate fluid therein,

the fluid reservoir and the further fluid reservoir being adapted for positioning in the flow of mud on opposite sides of the hydraulically operated valve means,

the control valve also being coupled between the further fluid reservoir and the actuation chamber, the control valve being operative, while blocking communication in the separate fluid between the fluid reservoir and the actuation chamber, for providing communication in the separate fluid between the actuation chamber and the further fluid reservoir to allow separate fluid to be transferred therebetween.

4,401,135

TUBULAR CASING WITH GLUED SEAM AND PROCESS FOR ITS MANUFACTURE

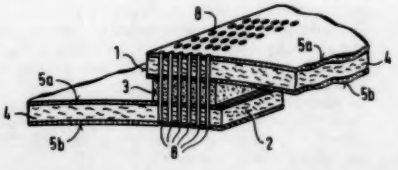
Klaus Andrä, Zornheim; Elfriede Hutschenreuter, Bad Schwalbach, and Walter Seifried, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,728

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013320

Int. Cl.³ F16L 11/00; A22C 13/00

U.S. Cl. 138—118.1 **22 Claims**



1. A seamed tubular casing suitable for containing foodstuffs, comprising:

a web of material curved about its longitudinal axis in such

a manner that its two longitudinal edge regions are positioned to form a seam;

a layer of substantially water-insoluble adhesion-promoting resin covering at least one of the inside and outside surfaces of said web in at least the area of said two edge regions;

a strip of film applied to said longitudinal edge regions forming the seam; and

a layer of pressure-sensitive adhesive interposed between said strip of film and the edge regions of said web of material, whereby the seam is sealed by said strip of film, via said layer of pressure-sensitive adhesive and said layer of adhesion-promoting resin.

4,401,136

TUBULAR CASING, PROCESS FOR ITS MANUFACTURE, AND ITS USE AS A SAUSAGE CASING

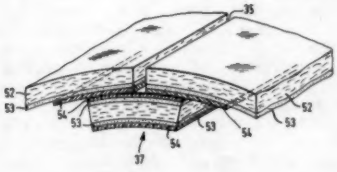
Herbert Porrmann, Niedernhausen; Walter Siefried, Wiesbaden; Ludwig Klenk, Hallgarten, and Karl Stenger, Ruedesheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 325,041

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045086

Int. Cl.³ F16L *11/00*; A22C *13/00*

U.S. Cl. 138—118.1 **18 Claims**



1. A casing for foodstuffs, comprising:

a web material formed into a tubular casing by curving the longitudinally running edges of said web material around the longitudinal axis of said web material and meeting or overlapping said edges to form a seam, wherein said web material comprises a fiber-reinforced regenerated cellulose comprising, in the wet remoistened state, in the longitudinal direction of the web, a breaking strength of about 15 to 30 N/mm^2 and an elongation at break of about 30 to 50% and, in the transverse direction of the web, a breaking strength of about 15 to 35 N/mm^2 and an elongation at break of about 30 to 50%, the breaking strength in the transverse direction of the web being equal to or greater than the breaking strength in the longitudinal direction of said web;

a film strip covering the regions adjacent to said edges whereby said film strip bonds said edges of said cellulose film and wherein said film strip comprises fiber-reinforced regenerated cellulose having the same values as said web material with respect to said breaking strength and elongation at break and having, at least on the surface coming into contact with said tubular casing, a layer containing a gas-impermeable and sealable material; and

a substantially gas-impermeable and sealable layer on the surface of said tubular casing facing said film strip.

4,401,137

FORMING FABRIC SEAM AND METHOD OF PRODUCING

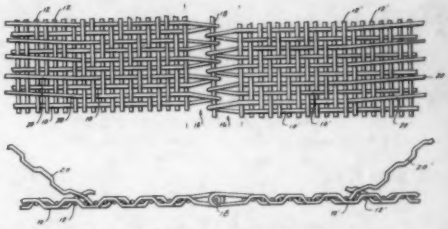
Frederick W. Cannon, Green Point, Australia, assignor to Albany International Corp., Menands, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,902

Claims priority, application Australia, Nov. 30, 1978, 42079/78

Int. Cl.³ D03D *3/04*

U.S. Cl. 139—383 A **15 Claims**



1. The method of producing a forming fabric for use in a papermaking machine which includes the steps of weaving a fabric having a warp and a weft system, forming loops at each of two ends of the fabric by extending selected warp yarns, and providing a tail portion of each loop forming warp projecting from the surface of the fabric whereby said loops may be interlaced with a joining pin through said loops to form an endless belt and said tail portions pulled causing the loops to collapse around the joining pin.

4,401,138

WOVEN SLIDE FASTENER STRINGER

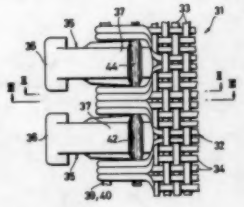
Kihei Takahashi, Uozu, and Kiyoshi Takeshima, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,489

Claims priority, application Japan, Aug. 8, 1980, 55-112488

Int. Cl.³ A44B *19/34*, *19/04*

U.S. Cl. 139—384 B **5 Claims**



1. A woven slide fastener stringer comprising:

(a) a stringer tape woven of a plurality of warp threads and a weft thread;

(b) a coupling element assembly woven into said stringer tape along one longitudinal edge thereof, said coupling element assembly including a row of spaced molded coupling elements each having a head portion and a pair of first and second leg portions extending from said head portion, and a connector interconnecting said coupling elements, said connector having longitudinal portions extending transversely through and embedded in said leg portions of each said coupling element;

(c) each said coupling element having a pair of grooves extending transversely through said first and second leg portions, respectively, on their respective outer sides,

each of said grooves being disposed adjacent to a heel of the respective leg portion; and

(d) at least a pair of anchor threads extending through said grooves of said first leg portions and through said grooves of said second leg portions, respectively;

(e) said weft thread having a plurality of loops each encircling said connector and said anchor threads between an adjacent pair of said coupling elements, each said loop being widened perpendicularly to the general plane of said stringer tape.

4,401,139

WEFT PICKING DEVICE OF AIR JET LOOM

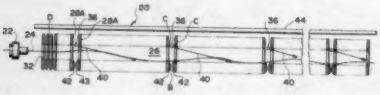
Masayuki Koriyama; Kimimasa Ohnishi, both of Tokyo, and Takao Ishido, Higashikurume, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 1, 1981, Ser. No. 250,005

Claims priority, application Japan, Apr. 11, 1980, 55-46874

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **8 Claims**



1. A weft picking device of an air jet loom having a weft inserting nozzle, said device comprising:

a plurality of air guide members spaced one from the other and in alignment with the direction of weft insertion, said air guide members being respectively formed with air guide openings to define a weft guide channel, each air guide member having a substantially closed loop section defining the air guide opening, said loop section being formed with a slit through which a weft yarn may escape from the air guide opening;

an auxiliary nozzle disposed in a first section of the space between two adjacent air guide members; and

means defining a second section of said space, the width of said second section being less than that of said first section, said second section being located opposite said first section relative to the axis of the weft guide channel.

4,401,140

FILLER VALVE FOR VALVE BAG

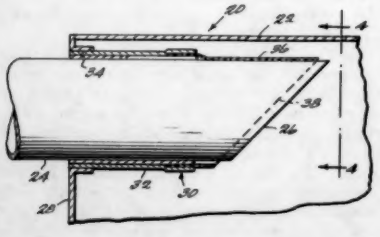
Karl Vogel, Bad Vilbel, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfort am Main, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,217

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040504

Int. Cl.³ B65B *3/04, 1/04*

U.S. Cl. 141—68 **6 Claims**



1. A filler valve for a valve bag adapted to have a filler nozzle inserted therein for filling the bag with bulk material comprising:

a tube of relatively stiff material adapted to have one end secured to the edge of an opening in a wall of the bag immediately below the top thereof and to project into the bag; and

a valve member comprising tube means of limp extremely flexible foil having one end thereof secured to the inner end of said tube of relatively stiff material and projecting therebeyond, whereby said foil tube means is normally collapsed to form a closure but is expandable by insertion of a filler nozzle into said valve.

4,401,141

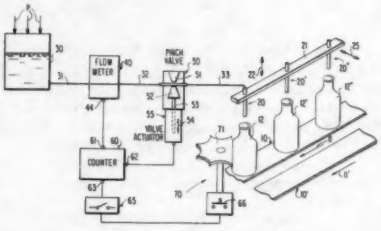
FILLING MACHINE

Robert Rosen, Owings Mills, and Wieslaw Bergandy, Arnold, both of Md., assignors to National Instrument Company, Inc., Baltimore, Md.

Filed Sep. 10, 1981, Ser. No. 301,054

Int. Cl.³ B65B *57/14*

U.S. Cl. 141—192 **14 Claims**



1. A filling machine for filling container means with an accurately predetermined amount of liquid product, comprising nozzle means, feed means for feeding fluid product to said nozzle means including measuring means for accurately measuring the liquid-flow rate of the liquid product and operable to produce in its output signals indicative of the liquid-flow rate, valve means in said feed means downstream of said measuring means for selectively interrupting the feed of the liquid product to said nozzle means, valve actuating means for selectively opening and closing said valve means, means responsive to signals of said measuring means, which are indicative of the amount of liquid product passing therethrough, and operatively connected with its input to the output of said measuring means and with its output to said valve actuating means so as to close said valve means upon receipt in its input of a predetermined number of signals representative of the predetermined amount of liquid product to be filled into a given container means to thereby interrupt the feed of the liquid product, said means responsive to the signal including reset means operable upon actuation thereof to cause reopening of said valve means by said valve actuating means so as to start another filling operation, and further means for automatically actuating said reset means in response to a signal from the filling machine indicating its readiness for the next filling operation.

4,401,142

COMBINATION PLANING, SAWING, MILLING AND MORTISING APPARATUS

Valentino Linossi, Sauris, Italy, assignor to Zinken Italiana S.p.A., Milan, Italy

Filed Apr. 30, 1981, Ser. No. 259,326

Claims priority, application Italy, May 8, 1980, 21765/80[U]

Int. Cl.³ B27C *9/04*

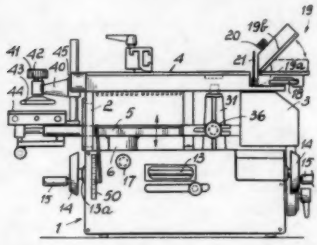
U.S. Cl. 144—1 R **4 Claims**

1. A combination planing, sawing, milling and mortising apparatus, comprising:

a stationary bed;

a sawing tool;
a milling tool having a milling tool shaft;
a mortising tool;
a manually activatable movable deck supported for vertically-displaceable movement with respect to said stationary bed;
adjustable backing means supported by said movable deck for positioning a workpiece to be mortised; and
movable support means for supporting said tools for movement relative to said stationary bed, said support means including:

(a) an oscillatable support arm coupled to said sawing tool and pivotably mounted on said stationary bed, a swivel arm pivotably connected to said movable deck and a first



pin-like clutch member for coupling and uncoupling said swivel arm and said support arm, so as to permit, in one position thereof, displacement of said sawing tool solely by means of the movement of said movable deck;

(b) a stationary hollow support mounted on said stationary bed, a bushing slidably mounted in said hollow support, which bushing carries said milling tool shaft, and a second pin-like clutch member for coupling and uncoupling said milling tool shaft-carrying bushing and said movable deck; and

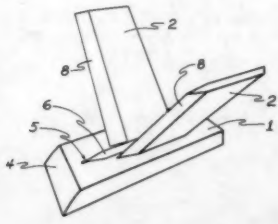
(c) a shaft rotatably supported by said stationary bed and coupled to said mortising tool and cooperating with said adjustable backing means for positioning the workpiece to be mortised.

4,401,143

LOG SPLITTING DEVICES

Richard P. Volcjak, Coulter Brook Rd., Bovina, N.Y. 13740

Filed Jun. 22, 1981, Ser. No. 275,646
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 E **5 Claims**



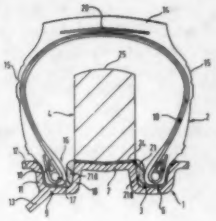
1. A quartering attachment for single fixed wedge log splitters, said fixed wedge of said log splitter having a sharpened leading edge, said quartering attachment consisting of a base, means in said base defining an opening to accomodate said fixed wedge of said log splitter, blade means attached to and extending upwardly from said base forming an acute angle relative thereto, said blade means having sharpened leading edges, said sharpened leading edges facing in the same direction as said fixed wedge.

4,401,144

WHEEL RIMS FOR PNEUMATIC TIRES

Ralph Wilde, Samele, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 125,584, Feb. 28, 1980, abandoned. This application Sep. 15, 1981, Ser. No. 302,592
Claims priority, application United Kingdom, Mar. 7, 1979, 7908017
Int. Cl.³ B60C *19/04, 15/02, 17/00*
U.S. Cl. 152—158 **11 Claims**



1. An assembly comprising a well-less wheel rim having a pair of axially spaced radially outwardly directed bead retaining flanges and a respective bead seat adjacent to each flange, a rim portion extending from bead seat to bead seat of a diameter substantially equal to or greater than the diameter of said bead seats, an annular safety support member mounted on said rim portion between the bead seats, said support member projecting radially outwards beyond said flanges to support a pneumatic tire mounted on the rim when the tire is in a deflated condition and support member locating means to axially locate said support member on said rim in predetermined spaced relationship with respect to the beads of a tire mounted on the rim and to permit relative rotation between the support member and rim when the tire is in a deflated condition supported by the support member, said support member locating means being defined by confronting radially directed surfaces of said support member and said rim portion between said bead seats, which are of complementary non-uniform radial dimension.

4,401,145

AMBIENT TEMPERATURE APPLICATION OF INDICIA TO ELASTOMER SUBSTRATES

Walter R. Hausch, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 156,893, Jun. 5, 1980, Pat. No. 4,311,181, which is a continuation-in-part of Ser. No. 73,760, Sep. 10, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,824
Int. Cl.³ F16L *11/12;* **B32B** *25/04, 25/12, 25/14*
U.S. Cl. 152—353 R **21 Claims**

1. A process for applying an amine curable prepolymer or polymer to a substrate, comprising the steps of:
applying a treating agent to the surface of a cured elastomer substrate, said treating agent selected from the group consisting of an N-halohydantoin, an N-haloamide, and an N-haloimide
applying a curable indicia to said treated substrate along a

limited portion of said substrate, said indicia containing an amine curable polymer or prepolymer, a polar solvent, and an amine curing agent, and

curing said indicia at ambient temperatures.

14. A process for repairing an elastomer substrate having a cut or gouge therein, comprising the steps of:

applying a treating agent to the cut or gouge of the elastomer substrate, said treating agent selected from the group consisting of N-halohydantoins, N-haloamides, and N-haloimides;

obtaining an amine curable prepolymer or polymer;

obtaining a polar or polarizable solvent selected from (a) compounds having dipole moments in excess of 0.4 debye in which there are no more than a total of 8 CH_3—, CH_2, or tertiary carbon radicals per polar group contained in said compound, and (b) benzene and biphenyl;

obtaining an amine curing agent;

mixing said amine curable polymer and prepolymer, said amine curing agent, and said polar solvent, and forming a liquid mixture;

applying said liquid mixture to said treated elastomer substrate and curing said liquid mixture at ambient temperature so that a strong bond is obtained whereby said article is repaired.

4,401,146

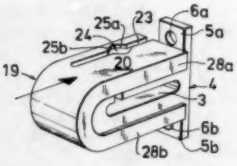
ROLLER BLINDS

Enar S. von Knorring, 38 Barkevagen, 770 20 Soderbarke, and Folke H. T. Swensson, 76, Vastmannagatan, 113 26 Stockholm, all of Sweden

Filed Feb. 19, 1981, Ser. No. 235,364

Int. Cl.³ E06B *9/20*

U.S. Cl. 160—319 **6 Claims**



1. Improvements in such roller blinds and the like which comprise a rotatably mounted roller, a flanged reel or pulley coaxially and fixedly secured to one end of said roller, a cord having one end thereof secured to said reel and being provided to be rolled upon the hub of said reel or unrolled therefrom to lower or raise the blind, and a cover housing said reel and having an opening for the passage of the cord, said cover having an elongated upper wall, an elongated lower wall and at least a front wall, the inner surface of said upper wall being parallel to the inner surface of said lower wall and spaced therefrom a distance slightly exceeding the diameter of the flanges of said flanged reel, at least said lower wall having an elongated opening to allow the passage of said cord, said reel being further provided to be displaced along said elongated walls when rotated, thereby also causing the roller to be displaced transversely, said elongated opening having such an extension that it allows said cord to pass through the same in a substantially vertical direction independent of the actual position of said reel relative to said cover.

4,401,147

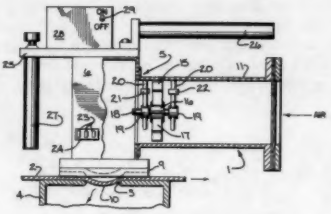
PORTABLE INSTRUMENT FOR MEASURING THE PERMEABILITY OF A PAPERMAKER'S FELT

David A. Beck, Appleton, and Gary V. Schultz, Kimberly, both of Wis., assignors to Appleton Mills, Appleton, Wis.

Filed Sep. 28, 1981, Ser. No. 306,170

Int. Cl.³ D21F *7/00*; G01M *3/02*; G01N *15/08*

U.S. Cl. 162—263 **8 Claims**



1. A papermaking apparatus, comprising in combination a vacuum box defining an internal chamber connected to a source of vacuum, said vacuum box having an opening communicating with said chamber; a porous web supported for travel on said vacuum box and disposed over said opening; and a portable air flow measuring apparatus for measuring air flow through said web, said measuring apparatus comprising a housing defining an internal chamber, said housing having an inlet opening through which air is introduced into said housing and having a discharge opening disposed in alignment with the opening in said vacuum box, air being drawn into said housing by the vacuum in said vacuum box and said air flowing through said discharge opening into said vacuum box, an anemometer disposed within the housing and including a plurality of blades disposed to be rotated by air flowing through said housing from the inlet to the outlet, measuring means for measuring the speed of rotation of said blades, means for converting said speed of rotation to a rate of air flow, a self-contained power source carried by the housing and operably connected to said measuring means for operating said measuring means, and means located on the housing for visually displaying said air flow rate.

4,401,148

METHOD FOR AUGMENTATION OF CONDENSATION HEAT TRANSFER BY APPLICATION OF NON-UNIFORM ELECTRIC FIELD

Akira Yabe, Yokohama; Yasuo Mori, and Kunio Hijikata, both of Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 10, 1980, Ser. No. 185,743

Claims priority, application Japan, Sep. 13, 1979, 54/117630

Int. Cl.³ F28F *1/00*

U.S. Cl. 165—1 **5 Claims**

1. A method for augmenting condensation heat transfer which method comprises:

opposing at least one wire electrode across a prescribed space to a condensation heat transfer surface;

applying to said at least one wire electrode an electric potential high enough to form a non-uniform electric field on said condensation heat transfer surface;

causing the condensate liquid occurring on the heat transfer surface to be drawn, by the non-uniform electric field, in the form of a liquid column between the heat transfer surface and the at least one electrode; and

causing the condensate liquid attracted to the at least one electrode to be further led to a prescribed position for storage.

4,401,149

METHOD AND DEVICE FOR CONTROLLING AN AIR CONDITIONING SYSTEM

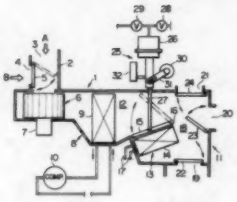
Tetsuya Iijima, Yamato, and Seiichi Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 26, 1981, Ser. No. 315,256

Claims priority, application Japan, Nov. 4, 1980, 55-153719

Int. Cl.[3] **F28F** *27/00;* **F25B** *29/00, 13/00*

U.S. Cl. 165—2 **7 Claims**



1. A method of controlling an air conditioning system including a refrigerant evaporator unit, a refrigerant compressor unit, a heater unit positioned downstream of the evaporator unit and an air-flow proportioning door positioned between the evaporator unit and the heater unit and with respect to the heater unit movable into and out of a predetermined angular position shutting off the flow of air from the evaporator unit to the heater unit, comprising the steps of

(1) producing signals and pieces of information, said signals being respectively representative of a desired temperature of the space to be air conditioned, a detected atmospheric temperature, a detected temperature of the air conditoned space, a detected angular position of said air-flow proportioning door, and a detected evaporator temperature of the air passed through said evaporator unit, said pieces of information being respectively indicative of the operative or inoperative condition of said refrigerant compressor, and a command of a person in the air conditioned space to put the refrigerant compressor unit into or out of operation,

(2) producing from the signals representative of the desired temperature of the space to be air conditioned, the detected atmospheric temperature and the detected temperature of the air conditioned space a target blowoff temperature of the air to be delivered from said evaporator unit,

(3) comparing said target blowoff temperature with a predetermined critical temperature for producing a signal indicative of said predetermined angular position of the air-flow proportioning door when the target blowoff temperature is found lower than said predetermined critical value or indicative of a desired angular position of the door, said desired angular position of the door being variable with said target blowoff temperature,

(4) in the presence of said piece of information indicating the person's command to put said refrigerant compressor into operation, producing from said target blowoff temperature signals respectively representative of desired compressor stop and start temperatures at which the compressor unit is to be brought to a stop and thereafter actuated to start, the desired compressor stop and start temperatures being variable with said target blowoff temperature when the target blowoff temperature is lower than said predetermined critical value and being fixed when the target blowoff temperature is higher than said predetermined critical value,

(5) comparing the signal representative of said detected evaporator temperature with said signals respectively representative of the desired compressor stop and start temperatures for producing a command signal to hold said compressor unit operative when the detected evaporator temperature is found higher than the desired compressor stop temperature with the piece of information indicating the operating condition of the refrigerant compressor unit and to actuate the compressor unit to a start when the detected evaporator temperature is found higher than the desired compressor start temperature with the piece of information indicating the inoperating condition of the refrigerant compressor unit, the command signal bringing the refrigerant compressor unit to a stop when the detected evaporator temperature is found lower than the desired compressor stop temperature with the piece of information indicating the operating condition of the refrigerant compressor unit, the command signal further holding the refrigerant compressor unit inoperative when the detected evaporator temperature is lower than the desired compressor start temperature with the piece of information indicating the inoperating condition of the refrigerant compressor unit, and

(6) in the presence of the signal representative of said desired angular position, comparing the signal representative of the desired angular position with the signal representative of the detected angular position of the air-flow proportioning door for producing a command signal indicative of the angular position to which said air-flow proportioning door is to be moved.

4,401,150

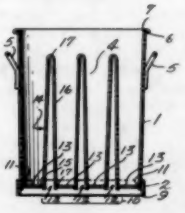
POLYMER COOLING CAN

Badger R. Bazen, Johnsonville, S.C., assignor to Badger R. Bazen Co., Inc., Johnsonville, S.C.

Filed Sep. 25, 1980, Ser. No. 190,628

Int. Cl.[3] **F24H** *3/00;* **F25D** *3/08*

U.S. Cl. 165—47 **12 Claims**



1. A container for cooling thermoplastic material, said container having side wall means, bottom wall means, a rim defining the open end of said container, and cooling channel means disposed on the interior thereof and extending across the interior of said container from one side to the other thereby forming a passageway for circulating cooling medium to assist in cooling the contents of said container inwardly of said side wall means,

said channel means comprising (a) an elongated opening in said bottom wall means extending across from one side of said container to the other side of said container; (b) heat transfer surface means commencing at one end of said opening, extending away from said bottom wall means into the interior of said container, returning back toward

said bottom wall means and meeting the opposite edge of said opening without discontinuity; and (c) apertures in said side wall means corresponding to an area defined by the intersection of said heat transfer surface means with said side wall means.

4,401,151

DEVICE FOR PUMPING A LIQUID OR GASEOUS CURRENT MEDIUM

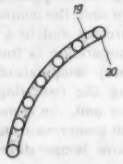
Wolfgang Pozsicsanyi, Schwäbisch Hall, Fed. Rep. of Germany, assignor to Wilhelm Gebhardt GmbH, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,516

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930240

Int. Cl.³ F28F *5/04*; F28D *15/00*

U.S. Cl. 165—86 **11 Claims**



1. A fan, for conveying a liquid or gaseous flow medium, the fan comprising: a fan housing for guiding the flow medium and a fan impeller driven by a motor and supported rotatably within said housing for conveying the flow medium through the housing, said fan impeller including shaft means carrying a number of fan blades, which fan blades are located in sequence along the peripheral direction of said impeller, the length of the fan blades extending in one of the approximately radial and axial directions of the impeller, a partition wall within the impeller for separating a warmer exhaust-air stream of the flow medium, which exhaust-air stream goes through the housing, from a cooler outside-air stream which also goes through the housing and cooperates heat-exchangingly with the exhaust-air stream within the housing, the fan further comprising the improvement wherein each fan blade contains several heat pipes of radially symmetrical cross section, which heat pipes are parallel to one another and approximately parallel the length of the fan blade, said fan blade having a hollow profile shaped blade body in which said heat pipes are enclosed, said heat pipes being distributed evenly in the fan blade interior and spaced from each other along the width of the fan blade interior, namely spaced from each other in a direction transverse to the length of the fan blade, wherein the partition wall separates the fan housing into chambers which are separate from one another, which chambers each have a respective one of the two streams flowing through same, and which thereby make said two streams flow parallel to one another, the axial end portions of the heat pipes which rotate with the associated blade each being associated with a respective one of the two conveyor medium streams.

4,401,152

HEAT EXCHANGER HAVING A PLURALITY OF VERTICAL PIPES FOR UPWARD PASSAGE OF A FIRST HEAT-EXCHANGING MEDIUM

Dick G. Klaren, IJmuiden, Netherlands, assignor to Esmil BV, Amsterdam, Netherlands

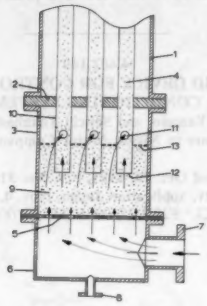
Filed Aug. 18, 1981, Ser. No. 294,022

Claims priority, application Netherlands, Sep. 5, 1980, 8005022

Int. Cl.³ F28D *13/00*

U.S. Cl. 165—104.16 **4 Claims**

1. Heat exchanger having a plurality of vertical pipes for upward passage of a first heat-exchanging medium, at least one compartment for passage of a second heat-exchanging medium through which compartment said pipes extend, a lower chamber through which said first medium passes and into which said pipes open for admission to the pipes of said first medium, and a flow distribution element adapted to distribute the flow of said first medium in said lower chamber to the pipes, there being present a fluidizable particulate material which, in operation, is maintained in a fluidized state in the pipes by the flow



of the first medium and the pipes having inlet elements extending downwardly into said lower chamber with their lowermost ends open and there being stabilization openings into said inlet elements above said open lowermost ends thereof, said stabilization openings being separated, outside the inlet elements, from the said open lowermost ends of the inlet elements by at least one screen which allows flow of the first medium to the stabilization openings.

4,401,153

HEAT EXCHANGER INCORPORATING NITRIDING-RESISTANT MATERIAL

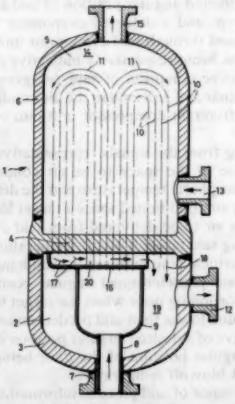
Hans-Dieter Marsch, and Hans-Günther Briecke, both of Dortmund, Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,026

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022480

Int. Cl.³ F28F *19/00, 9/02*

U.S. Cl. 165—134 R **11 Claims**



1. A heat exchanger for heat transfer such as between ammonia converter effluent recycle gas and water comprising a shell forming a closed space, a tubesheet secured within said shell and dividing the space therein into a pressure chamber on one

side of said tubesheet and a heat exchange chamber on the other side of said tubesheet, a plurality of heat exchange tubes located within said heat exchange chamber and each of said tubes having an inlet end and an outlet end secured to said tubesheet for carrying a heat exchange medium through said heat exchange chamber, the inlet and outlet ends of said tubes are welded to said tubesheet and arranged to convey the heat exchange medium medium through said heat exchange chamber, wall means located within said pressure chamber and dividing said pressure chamber into an inlet chamber for flowing the heat exchange medium into the inlet ends of said tubes and an outlet chamber for receiving the cooled heat exchange medium from the outlet ends of said tubes with said outlet chamber at least partly enclosing said inlet chamber so that the cooled heat exchange medium cools said inlet chamber, said tubesheet having a pressure chamber side and a heat exchange chamber side and a plurality of tubesheet holes extending from the pressure chamber side to the heat exchange chamber side, said tubes are formed of ferritic steel, said tube sheet having the inlet end of said tube connected thereto for receiving the heat exchange medium from said inlet chamber, and a tubular cladding of nitriding-resistant material extending through said tubesheet holes into the inlet ends of said tubes from the pressure chamber side of said tubesheet to at least the heat exchange chamber side, said inlet chamber is spaced from the pressure chamber side of said tubesheet by a portion of said outlet chamber and said wall means forming said inlet chamber comprising a wall section spaced from said tubesheet and having holes therethrough aligned with said holes in said tubesheet.

4,401,154

HEAT EXCHANGER CORE WITH END COVERS

Gene A. Anders, Peoria; Herbert J. Larson, Washington, and Charles R. Miller, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

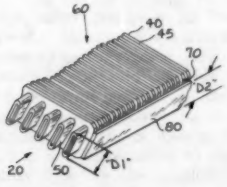
PCT No. PCT/US80/01516, § 371 Date Nov. 7, 1980, § 102(e) Date Nov. 7, 1980, PCT Pub. No. WO81/01608, PCT Pub. Date Jun. 11, 1981

Continuation-in-part of Ser. No. 133,635, filed as PCT/US79/01060, Dec. 3, 1979, § 102(e) Date, Dec. 3, 1979, abandoned. This PCT application Nov. 7, 1980, Ser. No. 224,511

Claims priority, application PCT Int'l Appl., Dec. 3, 1979, PCT/US79/01060

Int. Cl.³ F28F *1/32*

U.S. Cl. 165—151 **13 Claims**



1. In a heat exchanger core (20) having a plurality of closely spaced fins (40) having peripheral edges (45) defining an inlet surface (60), an outlet surface (65), and first and second end surfaces (70,75) and having at least one tube (50) extending through the fins (40) and being spaced from said inlet surface (60), said tube (50) having an elongated cross-section, said inlet surface (60) positioned generally at an angle between 10° and 40° with the flow of air to the inlet surface (60), the improvement comprising:

a cover (80 or 85) connected over the edges (45) of said fins (40) which define a respective one of said first and second end surfaces (70,75) and being spaced from said inlet surface (60) a distance substantially equal to the spacing of the tube (50) from the inlet surface (60), said cover (80 or 85) being substantially parallel to the tube (50).

4,401,155

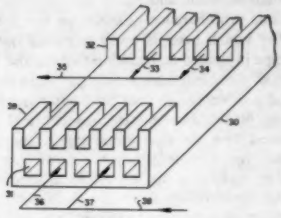
HEAT EXCHANGER WITH EXTRUDED FLOW CHANNELS

John H. Royal, Grand Island; Lawrence S. Graczyk, Hamburg, and William J. Owens, Kenmore, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 13, 1981, Ser. No. 234,258

Int. Cl.³ F28F *3/00*

U.S. Cl. 165—166 **6 Claims**



1. A heat exchanger comprising a plurality of modules stacked parallel, and unconnected, to one another, said plurality enclosed in a shell wherein each module comprises:

(a) a plurality of channels each having a continuous metal boundary around its cross-sectional perimeter and open at either end, said channels running parallel to one another and in the same plane, being generally equispaced and of generally uniform cross-sectional size and shape, and

(b) a plurality of metal fins, each fin extending substantially along the length of the module and perpendicular to the flow direction of the channels, above or below the channels, said fins being of generally uniform thickness and having an identical dimension perpendicular to said channels.

4,401,156

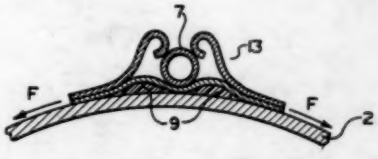
HEAT TRANSFER APPARATUS FOR RELEASABLY SECURING HEATING OR COOLING MEANS TO PIPE

Rudolph G. Wojtecki, Mantua, and Joseph P. Kaan, Stow, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 50,922, Jun. 21, 1979, Pat. No. 4,347,433. This application May 20, 1981, Ser. No. 265,292

Int. Cl.³ F28F *1/10*

U.S. Cl. 165—172 **13 Claims**



1. A heat transfer apparatus adapted to lay along the outer surface of a pipe having an outer circumference radius of curvature and to releasably secure at least one elongate heating or cooling means to the pipe, said apparatus comprising:

an elongate heat conductive base member having a wall having sufficient flexibility to conform to the radius of curvature of the outer circumference of the pipe,

a resilient side wall extending from the side of the base member that faces away from the pipe, said side wall extending over the base member to provide a longitudinally extending cavity therebetween that extends along the entire length of the base member and is suitably sized to contain the heating or cooling means, said side wall ending over the base member in a spaced-apart relationship with the base member to provide a longitudinally

extending entrance-way into the cavity along the entire length of the base member that is suitably sized to permit the heating or cooling means to be inserted into and removed from the cavity, and said side wall shaped in such a manner that when the heating or cooling means is inserted through the entrance-way and into the cavity the side wall presses uniformly against the heating or cooling means and urges said means against the base member to provide a more effective heat transfer contacting relationship therebetween, and

at least one protuberance disposed on the side of said base member which extends away from the outer surface of said pipe in spaced relationship thereto and faces towards said cavity and extends into said cavity to provide a longitudinally extending surface for positioning the heating or cooling means on the base member and providing an increased heat transfer contacting relationship between said heating or cooling means and said base member, and

means disposed along the length of the apparatus for securing the apparatus to the outer surface of the pipe, said securing means adapted to provide a secured heat transfer contacting relationship therebetween and designed so as not to interfere with the entrance-way in order that the heating or cooling means can be inserted into and removed from the cavity without having to release the apparatus from the pipe.

4,401,157

DEVICE FOR TIGHTLY ASSEMBLING A COLLECTOR AND A WATER BOX IN HEAT EXCHANGER

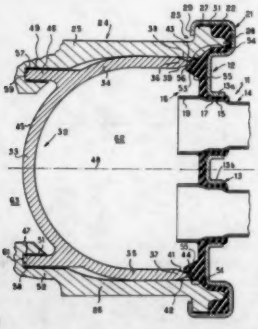
Patrick Cadars, Montigny le Bretonneux, France, assignor to Valeo, Paris, France

Filed Oct. 14, 1980, Ser. No. 196,974

Claims priority, application France, Oct. 12, 1979, 79 25507

Int. Cl.³ F28F 9/02

U.S. Cl. 165—173 **12 Claims**



1. A connecting device for assembling a collector traversed by the tubes of a tube bundle in a heat exchanger with the housing for the liquid flowing in the tubes, comprising an elastomeric sheet on the collector face opposite to the housing, wherein said elastomeric sheet comprises a marginal bulging portion projecting inwardly of the housing and used for cooperation with the edge of a through located in said housing so as to delimit a collecting chamber and an expansion chamber.

4,401,158

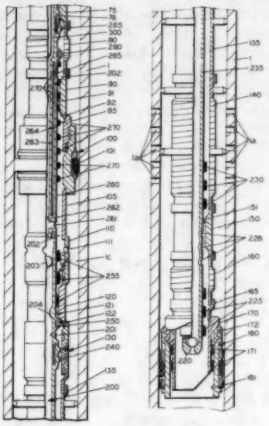
ONE TRIP MULTI-ZONE GRAVEL PACKING APPARATUS

Jack D. Spencer, Long Beach, Calif., and Joseph F. Donovan, Tomball, Tex., assignors to Baker International Corporation, Orange, Calif.

Continuation of Ser. No. 170,494, Jul. 21, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 325,420

Int. Cl.³ E21B 33/124, 34/14, 43/04, 43/10

U.S. Cl. 166—51 **5 Claims**



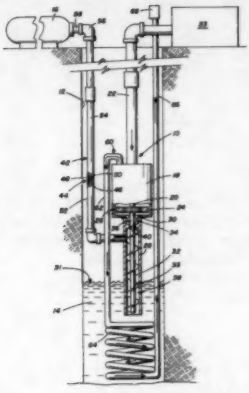
1. An apparatus for effecting the sequential gravel packing of a plurality of vertically spaced production zones within a subterranean well having casing in place therein, comprising: primary sealing means adapted for setting in the casing at a position above the production zones; a plurality of sets of production screens and valve means selectively movable between open and closed positions, said sets being equal in number to the production zones, and carriable in said well with the primary sealing means, said sets extending in series below the primary sealing means; production zone isolation means connected between each said set and expansible into sealing engagement with the casing intermediate the adjacent production zones; and a tubular control mandrel carriable on a conduit in the well with said primary sealing means and movable within all said sets, said control mandrel including: a single unitary cross-over tool for diverting downward flowing gravel carrying fluid from the interior of said control mandrel to the exterior thereof through at least one radial port; a plurality of vertically spaced sealing means on said cross-over tool for successively isolating each said set from the others when said radial port of said cross-over tool is positioned in axial proximity to each valve means; said cross-over tool further defining an axial passage for upwardly flowing return fluid from the production screen of said isolated set communicating with the annulus surrounding said cross-over tool at a position above said sealing means; means on said control mandrel for opening said valve means by longitudinal movement of said control mandrel in a first direction and closing said valve means by longitudinal movement of said control mandrel in a second direction; and means for supplying gravel carrying fluid to the interior of said control mandrel, whereby each successive production zone may be gravel packed by successively moving said conduit and said control mandrel to cooperate with each of said sets, without retrieving said conduit from within said well during said sequential gravel packing of said well.

4,401,159

JET ENGINE PUMP AND DOWNHOLE HEATER

William M. Kofahl, Licking, Mo., assignor to Flying K Equipment System, Inc., Licking, Mo.

Filed May 18, 1981, Ser. No. 264,864
Int. Cl.³ E21B *36/02, 43/24*
U.S. Cl. 166—59 13 Claims



1. A pump system for pumping fluid from a borehole, comprising:

a combustion engine having drive shaft means for imparting motion to the drive shaft means upon combustion of a fuel-air mixture, a byproduct of the combustion being heat in the combusted fuel-air mixture;

pump means directly coupled to the drive shaft means, the motion of the drive shaft means operating said pump means to draw fluid in the borehole into an inlet and pumping the fluid through an outlet out of the borehole; and

exhaust tubing string means for carrying the combusted fuel-air mixture from said combustion engine, said exhaust tubing string means having a heat exchanger portion for transferring heat from the combusted fuel-air mixture to the fluid to be drawn by said pump means to reduce the viscosity thereof.

4,401,160

DOME-TYPE PACKOFF WELLHEAD

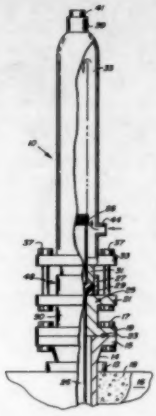
Glenn W. Anderson, Oildale, and Stanley O. Hutchison, Bakersfield, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 20, 1981, Ser. No. 284,747
Int. Cl.³ E21B *33/03*
U.S. Cl. 166—88 16 Claims

1. In a well having tubing for carrying hot fluids into or out of said well, a wellhead tubing expansion assembly adapted to accommodate axial elongation of said tubing within said wellhead, said tubing being fixed at a downhole location within a well and being freely elongatable above said fixed location and through said wellhead, said assembly comprising:

a packing gland surrounding said tubing above said wellhead;

said packing gland having a first flange attachable to said wellhead and a second flange attachable to said first flange, said second flange having a collar portion cooperating with said first flange to establish said gland and a hollow portion surrounding said tubing and providing an expansion zone for said tubing; and



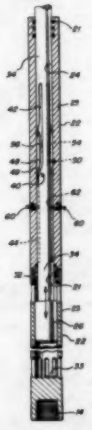
noncontacting means in said hollow portion for providing a communication channel from outside said hollow portion to inside said tubing within said hollow portion.

4,401,161

OIL WELL TOOL RETRIEVING DEVICE

Kenneth R. Warren, 4105 Walnut Dr., New Iberia, La. 70560

Filed Jan. 15, 1982, Ser. No. 339,972
Int. Cl.³ E21B *17/00, 31/107*
U.S. Cl. 166—178 7 Claims



1. An oil well tool retrieving device including an upstanding cylindrical casing defining a downwardly facing impact surface, an elongated mandrel slidingly and rotatably received within said casing and including upwardly facing hammer means engageable with said downwardly facing impact surface to establish an upper limit of movement of said mandrel relative to said casing, said casing and mandrel including coacting limit means engageable with each other to establish a lower limit of movement of said mandrel relative to said casing, said mandrel and casing including coacting yieldable intermediate stop means operative to releasably restrict upper movement of said mandrel past an intermediate position disposed between

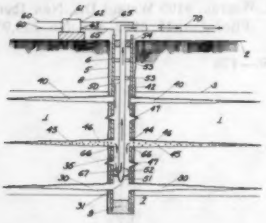
said lower and upper limit positions and to effect a sudden free release of said mandrel for subsequent free upward movement from said intermediate position toward said upper limit position upon an upward thrust on said mandrel relative to said casing above a predetermined high thrust value, said stop means including a double track raceway including a pair of generally parallel tracks extending longitudinally of said mandrel and rotary bearing means carried by said casing guidingly engaged in said raceway, one of the tracks of said raceway including hump means, means supporting said bearing means from said casing for shifting radially thereof and force means operatively connected between said casing and bearing means yieldably biasing said bearing means radially inwardly of said casing into tight seated engagement in said raceway, said raceway including angled tracks interconnecting corresponding end portions of said parallel tracks whereby full upward movement of said spindle will shift said bearing means from said one track to the other of said parallel tracks and full downward movement of said spindle relative to said casing will shift said bearing means from said other parallel track to said one parallel track, said hump means being disposed in said one parallel track intermediate the zones thereof into which said angled tracks open.

4,401,162

IN SITU OIL SHALE PROCESS

John S. Osborne, Indianapolis, Ind., assignor to Synfuel (an Indiana limited partnership), Indianapolis, Ind.

Filed Oct. 13, 1981, Ser. No. 310,786
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—248 **24 Claims**



1. In a method for the recovery of hydrocarbons from subterranean oil shale formations, including the steps of drilling a bore hole from the surface substantially to the bottom of an oil shale formation, inserting a metallic casing therein, fracturing the oil shale generally horizontally in at least two vertically spaced locations, propping the fractures with an electrically conductive material, and applying electromagnetic energy between said fractures for inductive heating of said oil shale, the improvement which comprises injecting molten metal into a lower generally horizontal fracture, providing a non-conductive spacer material in said casing above said fracture, and injecting molten metal into an upper generally horizontal fracture above said spacer, thereby forming a pair of vertically spaced, metallic electrodes in said upper and lower fractures.

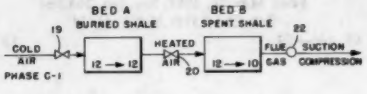
4,401,163

MODIFIED IN SITU RETORTING OF OIL SHALE

Lincoln F. Elkins, Oklahoma City, Okla., assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 29, 1980, Ser. No. 220,645
Int. Cl.³ E21B *43/247*
U.S. Cl. 166—259 **25 Claims**

1. A process for retorting a discrete bed of raw oil shale to produce shale oil therefrom comprising (a) rubblizing said bed, and thereafter (b) heating said bed to cause pyrolysis of the kerogen therein, said heating being accomplished by supplying a hot retorting gas to said bed in such a manner that the pressure in said bed cycles between higher and lower pressures, wherein said higher pressure is about 11 to 12 psia and said



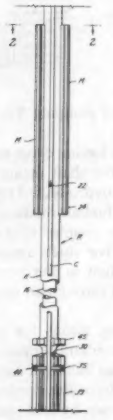
lower pressure is about 5 to 9 psia, whereby said hot retorting gas causes pyrolysis of said kerogen.

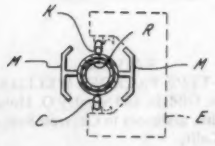
4,401,164

IN SITU METHOD AND APPARATUS FOR INSPECTING AND REPAIRING SUBSEA WELLHEADS

Benton F. Baugh, 14625 Oak Bend, Houston, Tex. 77079

Filed Apr. 24, 1981, Ser. No. 256,999
Int. Cl.³ E21B *17/01, 17/02, 41/04*
U.S. Cl. 166—379 **25 Claims**





1. In a marine riser having external hydraulic lines extending along the riser, the improvement comprising mounting means securing at least two such hydraulic lines to the riser substantially parallel to each other, said mounting means providing clearances adjacent to said hydraulic lines to provide substantially unobstructed guidance track means along the riser joint and from one riser joint to another for receiving a carriage adapted to run on such track means.

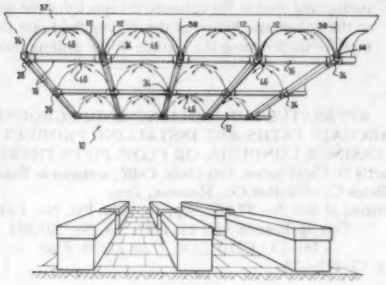
21. A marine riser connector having a flanged portion with spaced openings in the outer circumference thereof to allow unobstructed track means to extend along the axis thereof and spaced clearances adjacent to said openings in said flanged portion to allow substantially unobstructed guidance along said track means.

4,401,165

FIRE RESISTANT SUB-CEILING

Paul Gutermuth, Augustastrasse 48, D-6456 Langenselbold, and Heinrich Oetjen, Lindenallee 38, D-6456 Bruchköbel, both of Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,859
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015305
Int. Cl.³ A62C 35/00, 39/00
U.S. Cl. 169—54 10 Claims



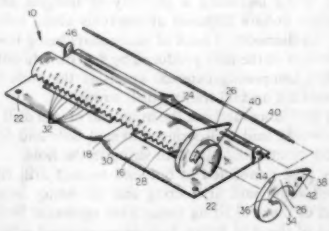
1. A suspended, fire-resistant covering for a supporting ceiling, said covering defining a space between said covering and said ceiling, said covering comprising arched ceiling elements with upper and lower surfaces and peripheral side edges, sprinkling elements mounted for discharge of liquid toward at least one surface of each ceiling element, collecting channels receiving the side edges of and supporting the ceiling elements, said collecting channels receiving liquid discharged from said sprinkling elements, and means maintaining a spacing between the side edges of the ceiling elements and the collecting channels receiving said side edges.

4,401,166

FURROW FOLLOWER VISION CORRECTION SYSTEM

Sam J. Brown, Cozad, Nebr., assignor to Sam J. Brown Land and Cattle Company, Inc., Cozad, Nebr.

Filed Aug. 31, 1981, Ser. No. 298,103
Int. Cl.³ A01B 69/00
U.S. Cl. 172—430 7 Claims



5. A furrow follower vision correction apparatus for a tractor having front and rear ends and a forwardly facing operator seat thereon, said apparatus comprising,

a base frame,

a transversely extended mounting strip secured on said base frame,

a sighting device mounted on the mounting strip with freedom of transverse movement therealong,

lock means for securing said sighting device in selected transverse positions along the mounting strip,

said lock means being fixed to said sighting device for transverse movement therewith,

means for fixedly supporting said base frame at the front end of a tractor at a position generally transversely centered thereon, and

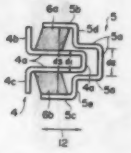
said mounting strip including transversely spaced calibrations whereby various selected transverse positions of the sighting device are identified by the calibrations for facilitated replacement of the sighting device to said selected transverse positions.

4,401,167

VIBRATORY TOOL WITH A VIBRATION PROOF MECHANISM FOR THE HANDLE THEREOF

Masaaki Sekizawa, and Yasuo Sasaki, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Ote, Japan

Filed May 15, 1981, Ser. No. 264,176
Claims priority, application Japan, Jul. 18, 1980, 55-99012
Int. Cl.³ E21B 12/00
U.S. Cl. 173—162 H 8 Claims



1. A vibratory tool with a vibration proof mechanism for the handle thereof, comprising a vibratory tool body, a handle for operating said vibratory tool, and a vibration proof mechanism interposed between said vibratory tool body and said handle, said vibration proof mechanism having a plurality of elements arranged in a direction substantially perpendicular to a longitudinal axis of said vibratory tool, each of said elements having first and second supporting members respectively connected fixedly to said vibratory tool body and to said handle or vice versa, and shock absorbing means made of an elastic material interposed between said first and second supporting members, said first supporting member being partially received in said second supporting member in such a manner that said second supporting member is movable in the direction of said longitudinal axis of said vibratory tool body with respect to said first supporting member, characterized in that said shock absorbing means comprises at least a pair of elastic members aligned in a line which is substantially perpendicular to a plane including the longitudinal axis of said vibratory tool body and said direction which is perpendicular to said longitudinal axis, in that said first and second supporting members are spaced from each other so that vibrations do not directly propagate therethrough and they do not come into contact with each other unless said second supporting member is rotated over a predetermined angle in a given direction with respect to said first supporting member, and in that said first and second supporting members each having a portion parallel to said longitudinal axis of said vibratory tool, and further in that the space between said first and second supporting members and the configuration of said first and second supporting members are selected so that the parallel portion of each of said first and second supporting members come into contact with each other to prevent over rotation of said handle.

4,401,168

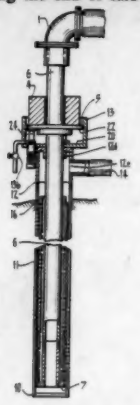
IMPACT APPLYING MECHANISM

Peter Claringbull, Kuala Lumpur, Malaysia, assignor to Conzinc Riotinto Malaysia Sendirian Berhard, Malaysia

Filed Jul. 9, 1981, Ser. No. 281,690
Int. Cl.³ E21B 1/02
U.S. Cl. 173—135 12 Claims

1. An impact applying mechanism comprising a cylinder arranged with its axis substantially vertical and connected, in use, to a member to which impact is to be applied, a piston slidably mounted within said cylinder, means to admit pressure fluid to said cylinder below said piston, at least one passage means slidably mounted in the base of the cylinder, first means to bias the upper end of the passage means into sealing engage-

ment with the underside of the piston when the piston is in its lowest position, a projecting portion on the upper end of said passage means upon which fluid pressure in the cylinder acts to produce a force urging the end of said passage means into



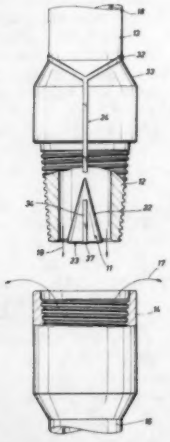
contact with the underside of the piston, and further biasing means to provide a force to said passage means of a magnitude which increases as the piston moves upwardly relative to the cylinder to subsequently urge the end of the passage means out of contact with the underside of the piston.

4,401,169

SYSTEM FOR LAGTIME MEASUREMENT DURING DRILLING

Valiant J. Neshyba, 3339 E. Bayou Dr., Dickinson, Tex. 77539

Filed Aug. 12, 1981, Ser. No. 292,270
Int. Cl.³ E21B *47/00*
U.S. Cl. 175—42 **13 Claims**



6. The method for measuring lagtime in a drilling fluid at dynamic circulating conditions during the drilling of a well with a fluid circulating drill bit on a drill pipe having pin and box connections, the steps comprising;

(a) securing the pipe with an upstanding box connection within the well;

(b) positioning a pin connection immediately above, but spaced slightly from the upstanding box connection;

(c) inserting and securing a cone-like container with its apex upwardly into the flow passageway of the pin connection and the container residing substantially within the pin connection by encircling a loop of elastic elongated resilient material about the pin connection with the container also secured to the resilient material;

(d) assembling threadedly the pin and box connections;

(e) flowing drilling fluid downwardly through the flow passageway of the drill pipe whereby an indicator material in said container is converted into a gas state by reaction with one or more components of the drilling fluid,

(f) detecting the arrival of the gas from the indicator material at the outflowing drilling fluid, and

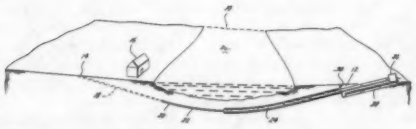
(g) correlating the time required for arrival of the gas in the outflowing mud to the volumetric capacity of the well and to the volumetric inflow of the drilling fluid into the drill pipe for determining the lagtime in the drilling fluid.

4,401,170

APPARATUS FOR DRILLING UNDERGROUND ARCUATE PATHS AND INSTALLING PRODUCTION CASINGS, CONDUITS, OR FLOW PIPES THEREIN

Martin D. Cherrington, Fair Oaks, Calif., assignor to Reading & Bates Construction Co., Houston, Tex.

Division of Ser. No. 77,960, Sep. 24, 1979, Pat. No. 4,319,648.
This application Sep. 21, 1981, Ser. No. 303,892
Int. Cl.³ E21B *7/08, 7/20, 17/00, 4/02*
U.S. Cl. 175—73 **1 Claim**



1. Apparatus for drilling along an underground inverted path comprising:

a directional drill including an in-hole motor;

a trailing drill string of non-uniform external diameter attached to said directional drill, the largest external diameter of said drill string being less than the diameter of the hole produced by said directional drill,

said in-hole motor including a rotor and a stator,

said drill including a bit connected to said rotor,

one end of said drill string being connected to said stator,

said drill string including a plurality of integral external concentric collars disposed at intervals along said drill string, the diameter of each of said collars being less than the diameter of the hole produced by said directional drill,

said collars comprising external upsets at the ends of the joints making up said trailing drill string,

a drill rig providing means at the other end of said drill string for crowding said drill string into said hole and for azimuthally positioning said drill string in the hole,

washover pipe connected at one end to said drill rig and disposed about said drill string and extending from said one end of the drill string toward but separated from said one end of the drill string, leaving an exposed portion of the drill string without said washover pipe, and forming with the covered portion of the drill string therewithin an inner annulus,

cutting means connected to the other end of said washover pipe,

said drill rig providing means to rotate said washover pipe around said drill string and advance the washover pipe along said path,

said washover pipe having an outer diameter larger than said drill bit but smaller than said cutting means whereby to form an outer annulus for drilling mud returns around the washover pipe as it is advanced along said path,

said drill rig providing means to deliver drilling mud to said drill string and said inner annulus,

fresh drilling mud from the drill rig flowing in said inner

annulus forwardly past said collars toward said cutting means providing lubricant between said collars of said covered portion of the drill string and said washover pipe spindled on the drill string and rotating about said collars, detritus laden drilling mud flowing backwards along the path back from the drill bit along the exterior of the exposed portion of the drill string past said collars which help size the hole drilled by said bit along said path by directing the detritus outwardly from the drill string,

said collars tending to prevent the exposed portion of said drill string from sticking when it is moved axially along said path without continuous rotation in the hole.

4,401,171

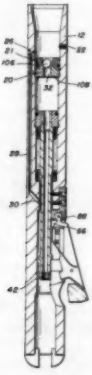
UNDERREAMER WITH DEBRIS FLUSHING FLOW PATH

Benjamin H. Fuchs, Long Beach, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 10, 1981, Ser. No. 329,361

Int. Cl.³ E21B *10/18, 10/34*

U.S. Cl. 175—267 **8 Claims**



1. An underreamer tool for enlarging an earth borehole, said tool comprising a tubular body having means for driving connection with a drill string and an axial bore extending therethrough; a plurality of cutter arms, including a cutter element, attached to said body by hinge means for movement between a retracted position wherein each arm and cutter element is disposed within an appropriately sized opening in said body and an outwardly extended position wherein said cutter element engages the borehole, said tool further including:

an axially moveable wash pipe disposed in the bore of said body including a piston member in sliding engagement with said bore and forming the upper end of said wash pipe and a depending pipe member in radially spaced relationship with the bore, said pipe and piston having an opening axially therethrough defining a primary drilling fluid flow path through said tool having an outlet below said hinge means and generally adjacent said cutter elements when in said extended position;

a secondary flow path through said body for delivering drilling fluid to said bore upstream of said hinge means to cause fluid flow from within said bore through said openings in said body when said arms are extended for flushing debris from between the extended arms and said tool body that would otherwise prevent said arms from retracting; and,

valve means independent of said wash pipe for normally blocking said secondary flow path during normal drilling operation.

4,401,172

DRILLING TOOL

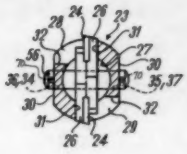
Jürgen Kessler, Stuttgart, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 21, 1981, Ser. No. 266,094

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020143

Int. Cl.³ E21B *10/32*

U.S. Cl. 175—283 **19 Claims**



1. A tool for drilling a conical enlargement into the surface surrounding a blind hole having a bottom, particularly into that portion of such surface which is adjacent to the bottom, comprising an enlongated tubular rotary guide insertable into the hole and having a plurality of windows; a plurality of elongated bit holders in said guide, one for each of said windows and each having a front portion provided with a bit and movable radially of said guide so that the bits carried by such front portions can extend outwardly through the respective windows to remove material from the surface around the hole while said guide rotates or be retracted into said guide, said holders further having rear portions and elongated cam grooves intermediate said front and rear portions thereof, cam means provided in said guide and extending transversely of and through said grooves, said holders having surfaces flanking said grooves and being configurated to move the front portions of said holders substantially radially outwardly to extended positions of the bits in response to movement of said holders lengthwise of said guide in a first direction and back into said guide in response to movement of said holders in a second direction counter to said first direction; and means for reciprocating said holders with reference to and axially of said guide, including a shank, means for pivotally connecting said shank with the rear portions of said holders, and means for moving said shank axially of said guide.

4,401,173

ELECTRONIC BALANCE WITH LOAD PLACEMENT DEVIATION CORRECTION

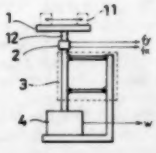
Akira Komoto, 3-10, Fujio Okumachi, Otsu-shi, Shiga 520, Japan

Filed Dec. 29, 1981, Ser. No. 335,363

Claims priority, application Japan, Dec. 29, 1980, 55-185640

Int. Cl.³ G01G *23/22, 3/14, 21/24*

U.S. Cl. 177—25 **10 Claims**



1. An electronic balance comprising a pan for receiving a load to be weighed, a first means for measuring said load on said pan, said means being adapted to measure a load normally acting on said pan, a second means for detecting a possible deviation of the line of action of said load from the required

point of placement on said pan, a third means for correcting an error in the measured value in accordance with a detected degree of deviation, and a fourth means for outputting said corrected value.

4,401,174

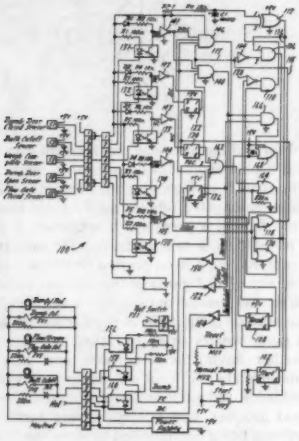
WEIGH SCALE MACHINE HAVING SOLID-STATE CONTROLLER

Marshall E. Nemechek, Humboldt, Iowa, assignor to Douglas & Lomason Company, Farmington Hills, Mich.

Filed May 28, 1981, Ser. No. 267,740

Int. Cl.³ G01G *13/24*

U.S. Cl. 177—114 **15 Claims**



1. In an automated weigh scale machine having an infeed chute, a weigh bucket, a flow gate for controlling product flow from the infeed chute into the weigh bucket and first actuating means for controlling the position of the flow gate, a scale mechanism for weighing the product in the weigh bucket, and a dump door for dispensing product from the weigh bucket into a container and second actuating means for controlling the position of the dump door; control means for controlling the operation of the weigh scale machine comprising:

first sensing means for monitoring the position of said flow gate;

second sensing means for monitoring said scale mechanism and producing a weigh signal when the weight of the product in said weigh bucket equals a predetermined desired product weight;

third sensing means for monitoring the position of said dump door sensing when said dump door is fully open;

fourth sensing means for monitoring the position of said dump door sensing when said dump door is closed;

first semiconductor bistable means alterable between first and second states and responsive to said first sensing means for providing a dump door control signal;

second semiconductor bistable means alterable from a first state to a second state in response to said weigh signal;

first logic gating means responsive to said first and second bistable means and to said fourth sensing means for providing a flow gate control signal causing said first actuating means to open said flow gate when said dump door is closed and said first and second bistable means are in said respective first states and to close said flow gate when said second bistable means is in said second state;

second logic gating means responsive to said second bistable means and to said first sensing means for switching said first bistable means from said first state to said second state when said flow gate is closed and said second bistable means is in said second state;

said second actuating means responsive to said dump door control signal to open said dump door when said first bistable means is in said second state and to close said dump door when said first bistable means is in said first state;

third logic gating means responsive to said third sensing means for switching said first and second bistable means to said respective first states when said dump door is fully open; and fault detection means for detecting when said flow gate and said dump door are both open at the same time and for providing a fault indication.

4,401,175

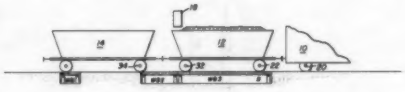
SYSTEM FOR WEIGHING RAILROAD CARS IN MOTION DURING LOADING

Jack R. Caldicott, Barrington, Ill., assignor to Mangood Corporation, Chicago, Ill.

Continuation of Ser. No. 40,572, May 21, 1979, abandoned. This application Jul. 16, 1981, Ser. No. 283,773

Int. Cl.³ G01G *19/04, 19/02*

U.S. Cl. 177—163 **17 Claims**



1. A method for weighing freight cars coupled in motion, which comprises the steps of:

providing an upstream weigh bridge having a length that is less than the distance between the rear axle of one car to be loaded and the front axle of the succeeding car;

providing a downstream weigh bridge mechanically separated from said upstream weigh bridge;

detecting the full draft weight of the freight car during loading taking the weight on said upstream weigh bridge into consideration while an axle of the car is on said upstream weigh bridge; and

determining the weight of the loaded freight car after the freight car has left the upstream weigh bridge and taking only the weight of the downstream weigh bridge into consideration, said determining means including means for electrically disconnecting said upstream weigh bridge from said downstream weigh bridge after the freight car has left the upstream weigh bridge.

4,401,176

ELECTRONIC WEIGHER WITH A WEIGHING SCALE LOCATED ABOVE THE WEIGHER CASING

Erich Knothe, Bovenden; Franz-Josef Melcher; Jürgen Ober, both of Hardegsen; Walter Södler, Pforzheim-Bii., and Veronika Martens, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Feb. 10, 1982, Ser. No. 347,626

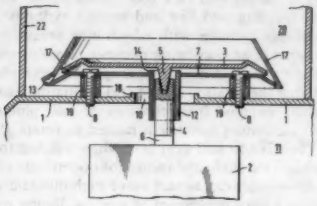
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 8104877[U]

Int. Cl.³ G01G *21/00, 23/48*

U.S. Cl. 177—180 **8 Claims**

1. An electronic weigher with a weighing scale located above a weigher casing and supported, via one or more connecting pieces by a load receiver positioned inside said weigher casing, the load receiver being part of a power measuring system, characterized in that below the weighing scale and at a short distance therefrom a lower plate is fastened to the weigher casing said lower plate being provided with a central hole through which the connecting pieces between said weighing scale and said load receiver pass with a small lateral play,

and that the lower plate is shaped in such a way that between the lower plate and said weigher casing a path with low resistance to airflow remains open between the interior and the exterior of said weigher casing.



4,401,177

SLIDING WEIGHT SCALE

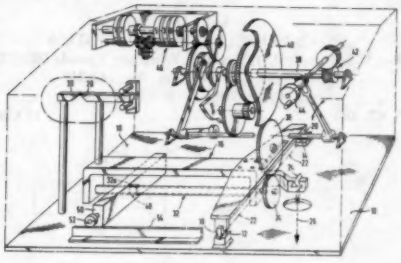
Werner Haack, Chur, Switzerland, assignor to Brevet AG, Schaan, Liechtenstein

Filed May 24, 1982, Ser. No. 381,564

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121027

Int. Cl.³ G01G *1/26*

U.S. Cl. 177—250 **8 Claims**



1. Sliding weight scale comprising a base plate, support blocks secured on said base plate, a balance beam having knife edges spaced apart along a swivel axis and supported on said support blocks so that said balance beam swivels on the swivel axis, a threaded spindle supported on said balance beam with the axis of said spindle extending perpendicularly to the swivel axis, a sliding weight in threaded engagement on said threaded spindle, means for securing said sliding weight against rotation about said threaded spindle, a drive gear assembly mounted on said base plate and including a first spur gear supported in a fixed position on said base plate, said threaded spindle is a recirculating rolling member spindle having a male thread, said sliding weight having a female thread, and a plurality of rolling members in engagement with said female thread and said male thread and coupling said sliding weight and said spindle so that as said spindle rotates said sliding weight extending transversely of the spindle axis moves in the direction of the spindle axis.

4,401,178

WHEELCHAIR CARRIER

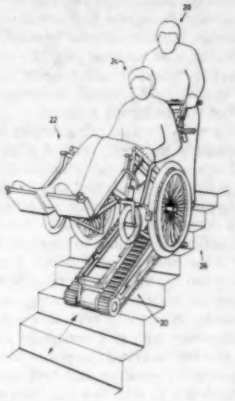
Beat W. Studer, Zug, Switzerland, assignor to Stair Aid Corporation of North America, Concord, Canada

Filed Oct. 14, 1980, Ser. No. 196,316

Int. Cl.³ B62B *5/02*

U.S. Cl. 180—8 A **23 Claims**

1. A stair climbing wheelchair carrier comprising a handle assembly and base, the handle assembly adapted for securing the wheelchair to the carrier, means for securing the handle assembly to the base, the base comprising a pair of spaced endless tracks having climbing lugs on the outside surface thereof, each of the endless tracks entrained around a pair of rollers and passing under the outer surface of a runner, one of the rollers situate proximate one end of the runner, the other proximate the other end, the runner being bent intermediate its ends to form a first portion extending away from one of the rollers and a second portion extending away from the first portion towards the second roller at an angle of between about 125° and about 145° to the first portion, the length of track extending under the second portion and around the roller proximate the second portion being such as to extend over the usual bottom step of the staircase when the carrier is positioned proximate the bottom of the staircase, and the disposition of the first portion of the runner being such as to overlie the surface on which the wheelchair is used whereby the track engaging the surface or stair is fully supported.



4,401,179

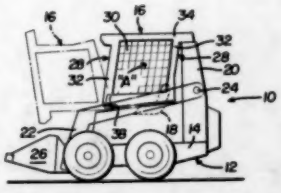
ASSIST ASSEMBLY FOR CAB STRUCTURE

Robert M. Anderson, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 4, 1981, Ser. No. 299,376

Int. Cl.³ B62D *27/00*

U.S. Cl. 180—89.14 **2 Claims**



1. In a cab structure for an earth-working machine, said cab structure having the shape of an inverted open box with one edge thereof rotatably connected to a frame portion of said earth-working machine for permitting rotational movement of said cab structure about a horizontal axis that is transverse to the longitudinal axis of said machine, said cab structure being rotatable from a first stop position where its longitudinal axis is substantially parallel to the longitudinal axis of said machine to a second stop position where its longitudinal axis is substan-

tially perpendicular to the longitudinal axis of said machine, the improvement comprising:

an assist assembly for reducing the work required by an operator in rotating said cab structure from its first stop position to its second stop position or from its second stop position to its first stop position, said assist assembly including a bellcrank member rotatably connected to a support means on said machine frame portion, a transmission linkage pivotally attached at one of its ends to an upper end of said bellcrank member and having its opposite end pivotally attached to said cab structure at a point radially outward from said horizontal axis, an extensible and retractable actuator constantly biased toward an extended position, said actuator pivotally connected at one end to a support means on said machine frame portion and having its opposite end pivotally connected to an opposite lower end of said bellcrank member;

the center of gravity for said cab structure moving through a point which is in direct vertical alignment with said horizontal axis when said cab structure is rotated from its first stop position to its second stop position or from its second stop position to its first stop position, said actuator applying a constant force on said bellcrank member that urges said bellcrank member to rotate in a first direction, the force from said actuator being transferred to said transmission linkage by said bellcrank member for providing mechanical assistance in rotating said cab structure until its center of gravity coincides with said point of vertical alignment with said horizontal axis, and said cab structure exerting a greater opposite force on said bellcrank member for rotating said bellcrank member in a direction opposite to said first direction when the center of gravity of said cab structure moves beyond said point of vertical alignment whereby said bellcrank member reverses the direction of stroke of said actuator and said actuator dampens or retards the rotational movement of said cab structure until it reaches a stop position.

4,401,180

POWER STEERING DEVICE FOR VEHICLES

Masao Nishikawa, Tokyo; Yoshihiko Toshimitsu, Asaka; Toshihiko Aoyama, Tsurugashima; Tokuro Takaoka, Takaidohigashi; Takashi Aoki, Asaka, and Yoichi Sato, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

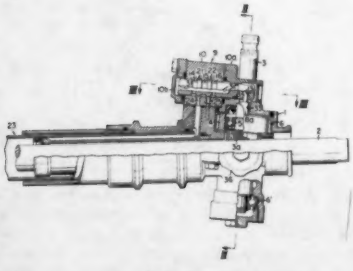
Division of Ser. No. 92,499, Nov. 8, 1979, Pat. No. 4,299,302. This application Jun. 9, 1981, Ser. No. 272,027

Claims priority, application Japan, Nov. 14, 1978, 53-140695

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.³ B62D *3/12, 5/10;* F15B *9/10*

U.S. Cl. 180—148 **2 Claims**



1. A power steering device for a vehicle comprising: a pinion shaft having a pinion and operably connected with a steering wheel, said pinion shaft extending into a gear box through a seal member disposed therebetween; a rack rod operatively connected to steerable wheels and having a rack in mesh with the pinion of said pinion shaft within a gear box; a power cylinder having a first and a second hydraulic chamber for hydraulically actuating said rack rod; a changeover valve for selectively connecting said first and second hydraulic chambers of said power cylinder with a hydraulic pressure source and an oil reservoir; an oscillating member rotatably mounted on said gear box and rotatably supporting said pinion shaft in a manner such that the rotation axis of said oscillating member is offset a certain distance from the axis of said pinion shaft whereby said oscillating member is caused to rotate about its rotation axis relative to said gear box when steering torque is applied to said pinion shaft; and means for operatively connecting said oscillating member to said valve such that said valve is actuated by the rotary movement of said oscillating member, the improvement comprising said oscillating member being in the form of a cage containing and partially surrounding said pinion, bearing means supported by said gear box and surrounding said cage, said pinion shaft extending from one axial end of the cage and being located inside said bearing means, said bearing means supporting said cage for movement of said cage relatively to said gear box exclusively about the longitudinal axis of said cage, whereby said cage is caused to oscillate about its longitudinal axis relative of said gear box when steering torque is applied to said pinion shaft; and means operatively connecting said oscillating cage to said changeover valve such that said changeover valve is actuated by rotary movement of said oscillating cage.

4,401,181

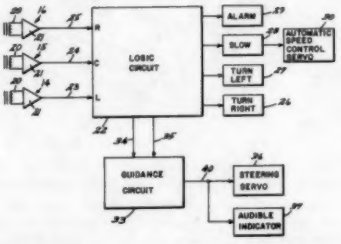
ROAD VEHICLE CONTROL SYSTEM

Alfred V. Schwarz, P.O. Box 425, Winnipeg, Canada (R3C 2H6)

Filed Mar. 12, 1981, Ser. No. 243,262

Int. Cl.³ B60K *31/00;* B62D *1/28*

U.S. Cl. 180—168 **13 Claims**



1. A motor vehicle guidance system for use on a roadway having a plurality of marking elements indicative of the position of the lanes of travel for vehicles using the roadway and indicative of lowered speed zones in the roadway, the motor vehicle guidance system comprising:

sensing means attached to said motor vehicle for sensing said lane marking elements and generating sensing signals indicative of the proximity of the vehicle to the marking elements;

control means operative in response to said sensing signal to produce control signals corresponding to the position of the motor vehicle with respect to the lane of travel and of the presence of a lowered speed zone;

indicating means operative in response to said control signal to produce an indication to the motor vehicle operator of corrective steering required to maintain the motor vehicle within the lane of travel on said roadway, and of the presence of a lowered speed zone;

guidance means operative in response to said control signals to produce a steering signal indicative of the direction and amount of steering correction required to keep the vehicle in the lane of travel; and

audible indicating means responsive to said steering signal to

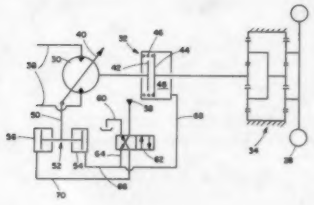
produce an audible signal whose volume is indicative of the amount of steering correction required to keep the vehicle in the lane of travel.

4,401,182

VARIABLE DISPLACEMENT HYDRAULIC DRIVE WITH DISCONNECT

Frederic W. Pollman, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 10, 1980, Ser. No. 214,927
Int. Cl.³ B60K *41/00*
U.S. Cl. 180—242 **14 Claims**



1. A positive displacement fluid drive transmission system for a vehicle having ground engaging means and including a prime mover, pump means driven by said prime mover, variable displacement fluid motor means, displacement control means operatively controllingly coupled to said motor means, fluid passageways means interconnecting said motor means to said pump means in driving relationship, clutch means drivingly connecting said motor means to said ground engaging means, said clutch means having an engaged position and a disengaged position, said transmission system characterized by said displacement control means for said motor means having a zero displacement position to preclude said motor means from being driven by said pump means, a multi-position control means controllingly coupled to both said clutch means and said displacement control means for said motor means, said multi position control means having a first position wherein said clutch means is in said engaged position and said motor means is driven and a second position wherein said clutch means is in said disengaged position and said motor displacement control means is in said zero displacement position.

4,401,183

HIGH RISE LIFE ESCAPE LADDERS

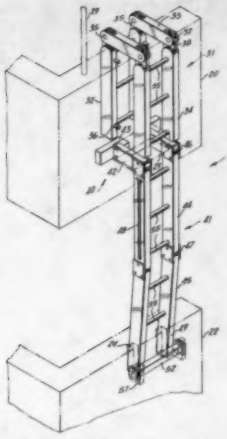
Eli Schler, 1325-13th Ter., Miami Beach, Fla. 33139

Filed Apr. 2, 1982, Ser. No. 364,790
Int. Cl.³ E06C *9/10, 9/14, 1/383, 1/52*
U.S. Cl. 182—8 **5 Claims**

1. A fire escape ladder system for high rise buildings having balconies provided with parapets, comprising:

A. First ladder means mounted on sides of said parapets including a fixed inner ladder that allows the user to reach the top of the parapet and an outer ladder hingedly connected to the upper end of said inner ladder and extending downwardly;

B. second ladder means including an upper ladder section having a flanged termination, a middle ladder section hingedly connected to said upper section, and a lower ladder section hingedly connected to said middle ladder section, and second ladder means being removably mounted in said balconies through a cooperating opening in said parapet of sufficient size to allow said ladder sections to slide through and small enough to prevent said flange termination from sliding through.

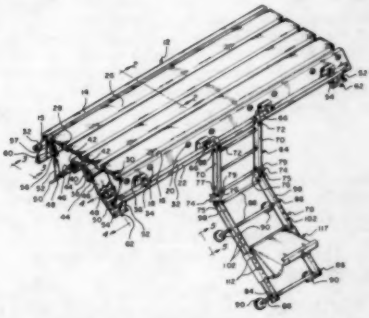


4,401,184

ROOF SKID

Howard W. Sherry, 111 Webster Ave., Stratford, N.J. 08084

Filed Mar. 22, 1982, Ser. No. 360,210
Int. Cl.³ E04G *3/12*
U.S. Cl. 182—45 **26 Claims**



1. A roof skid suitable for placement on the ridge of a sloped roof of a structure, comprising:

(a) a frame comprising side members along the length of the skid with the length to be laid along the same direction of the ridge of a roof,

(b) a frame support means providing support for the frame to rest on the ridge of the roof and on both sides of the roof to support the roof skid,

(c) at least one hanging support means attached on a side member to support hanging weight,

(d) at least one pivot angle ladder attached to swing on the hanging support means and depending from the side member toward the roof surface,

(e) a lateral lower ladder rigidly attached, adjustable to a chosen angle to the lower end of the pivot angle ladder, and

(f) at least two feet means extending from the lower ladder to rest on the roof surface and support the lower ladder essentially parallel to the sloped roof surface.

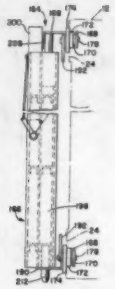
4,401,185
SAFETY CONTROL SYSTEM FOR CONTAINER OPERATIONS

Vincent G. Grey, 607 Randolph St., Falls Church, Va. 22046

Division of Ser. No. 922,208, Jul. 6, 1978. This application Jun. 24, 1981, Ser. No. 277,024

Int. Cl.³ E06C 1/34

U.S. Cl. 182—93 15 Claims



1. The combination with a container having a fitting including a plurality of apertures providing openings to a hollowed-out interior along mutually perpendicular axes at each corner of said container, of a ladder having an adjustable length to extend from a location adjacent a corner fitting at the bottom of said container to a location at least adjacent a corner fitting at the top of said container, said ladder defined by a frame including a pair of spaced apart members, first rail means mounted by said members in a manner to provide a track, second rail means received in said track for movement relative to said members in adjustment of the overall length of said ladder, each said rail means being substantially coextensive in length and having a first, upper end and a second, lower end, and means for mounting said ladder to said top and bottom corner fittings of said container, said mounting means cooperating with the first end of one rail means and the second end of the other rail means.

4,401,186
SIDE PROTECTION DEVICE FOR SCAFFOLDINGS

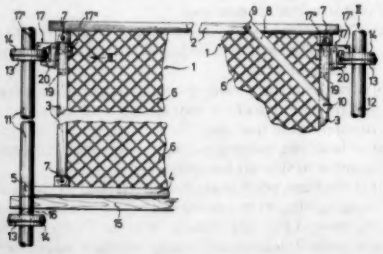
Gerhard Dobersch, No. 10, Adolf-Kaschny-Strasse, 5090 Leverkusen, Fed. Rep. of Germany

Filed Jan. 20, 1982, Ser. No. 340,927

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103339

Int. Cl.³ E04G 1/26

U.S. Cl. 182—113 1 Claim



1. A side protection device for scaffoldings, particularly metal scaffoldings including a plurality of substantially vertical tubular posts, each having at least one bracket thereon, traverses attached to the posts, and a boarding resting on the traverses, said side protection device comprising a collapsible framework which is composed of at least one horizontal tubular brace and two substantially vertical tubular side members affixed to the ends of the horizontal tubular brace and which can be suspended by means of two supporting arms on two brackets occupying a fixed position on the tubular posts of the scaffolding and which after being suspended thereon extends downwards as far or almost as far as the boarding of the scaffolding, characterized by the fact that the ends of the supporting arms (17) pass, with a certain amount of clearance, through two elongated mounting devices (18) situated on the vertical tubular side members (3) of the frame work of the side protection device, in such a way that the said side protection device, after being mounted onto the tubular posts (11, 12), will be vertically displaceable by the supporting arms and vertically pivotable, about the supporting arms, towards the relevant section of the scaffolding.

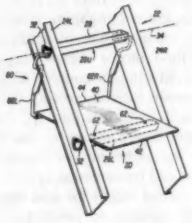
4,401,187
LADDER PLATFORM ACCESSORY

Charles E. Van Patten, 2300 Crocker Ave., Portsmouth, Va. 23703

Filed Aug. 26, 1981, Ser. No. 296,289

Int. Cl.³ E06C 7/16

U.S. Cl. 182—121 11 Claims



1. A platform accessory selectively attachable to a ladder, said ladder having two side rails connected by a plurality of hollow rungs, said accessory comprising:

an essentially flat platform member adapted to engage a first rung of said ladder, said platform member having first and second edges oriented essentially parallel to the axis of said first rung;

bracket means by which said platform member is connected to a second rung of said ladder, said second rung being vertically above said first rung, said bracket means comprising bracket arms associated with each of two said side rails, said bracket arms being oriented essentially vertically when said ladder is in a position of use, each of said bracket arms having a lower bracket end portion, an upper bracket end portion, and an intermediate bracket portion between said upper and lower end portions,

said lower bracket end portion of each bracket arm being engageable with said second edge of said platform member and extending upwardly therefrom just inside a vertical plane wherein said associated side rail lies;

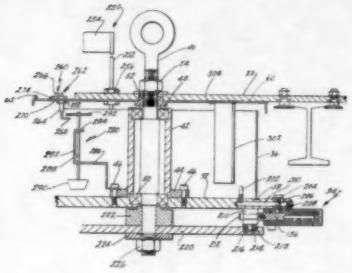
said upper bracket end portion of each bracket arm being securely insertable into the hollow portion of said second rung of said ladder, said upper end portion extending into said second rung from outside said vertical plane wherein said associated side rail lies; and,

said intermediate bracket portion extending from just inside said vertical plane portion wherein said associated side rail lies to just outside said vertical plane and bearing against said associated side rail.

4,401,188
CHAIN SPRAYING APPARATUS

Siegfried K. Weis, Byron Center, and Charles C. Frost, Ada, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Apr. 6, 1981, Ser. No. 251,334
Int. Cl.³ F16N 7/14
U.S. Cl. 184—15 B **27 Claims**



27. A chain spraying device for spraying a moving chain with a liquid, said device including:

a stationary support;

a shaft nonrotatably fixed to said support;

a liquid supply tank;

bearing means for rotatably mounting the supply tank on said shaft;

an agitator plate fixed to said stationary support and extending into said supply tank to agitate a liquid therein when the tank rotates;

rotation means operatively connected to said tank for rotating said tank about said shaft; and

liquid spray means operatively connected to said supply tank for spraying a liquid onto a moving chain, said rotation means comprises a sprocket rotatably mounted on said shaft and supporting said tank, said sprocket including a plurality of teeth dimensioned to engage a moving chain, said liquid spray means comprising:

each of said teeth defining a longitudinally extending chamber and at least one nozzle bore intersecting said chamber;

a plunger slidably disposed in said chamber; and

cam means engaging said sprocket for reciprocating said plunger within said chamber as said sprocket rotates, and

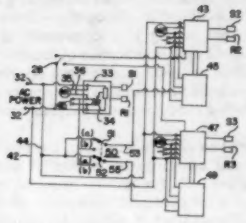
wherein said liquid spray means further includes air means for entraining air with the liquid sprayed by said spray means.

4,401,189
START/STOP CONTROL SYSTEM FOR CONVEYOR MEANS

Stanley J. Majewski, Chicago, Ill., assignor to St. Charles Manufacturing Co., St. Charles, Ill.

Filed Nov. 23, 1981, Ser. No. 323,901
Int. Cl.³ B65G 47/00
U.S. Cl. 186—68 **9 Claims**

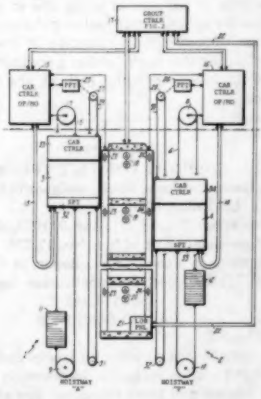
1. A control system for an item checking stand having an onloading point and at least two packaging stations, means defining respective tracks extending past a checking station from said onloading point to said packaging stations, a first conveyor belt extending from said onloading point toward said checking station for feeding a succession of items to be checked to said checking station, a second conveyor belt extending from a position that is adjacent said checking station and to a first packaging station, a third conveyor belt extending from said position to a second packaging station, respective motor means for driving said belts, switch means for selectively engaging said motors whereby said first belt may be driven concurrently with said second belt and said first belt may be driven concurrently with said third belt, second switch means for selectively engaging said motors to drive said second and third belts independently of said first belt, a diverter bar having a magnet mounted on one end thereof, a magnetically actuable switch mounted adjacent said position, said bar being movable between the ends of said second and third belts to selectively actuate said magnetically actuable switch for selectively controlling the operation of said second and third belts.



4,401,190
CARS/FLOORS AND CALLS/CARS ELEVATOR ASSIGNMENTS

Joseph Bittar, Simsbury, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 99,396, Dec. 3, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,745
Int. Cl.³ B66B 1/20
U.S. Cl. 187—29 R **2 Claims**



1. An elevator system including a group of elevators for servicing a plurality of floor landings divided into zones in a building, comprising:

group controller means, including hall call means for registering calls for up and down service at each of said landings and signal processing means for exchanging signals with each of said elevators, responsive to said hall call means and to said signals indicative of conditions of said cars for determining the zone in which each car is located, for assigning cars to zones, and for providing zone control over the cars including determining empty zones, determining the floor of highest and lowest hall calls in each zone, providing zone demand signals to the cars to command the cars to move upward or downward in the building to fill empty zones with unassigned cars and to cause

assigned cars to reach floors in their respective zones where hall calls are registered, determining up and down peak traffic conditions, forcing cars from selected zones in the high end of the building to the main landing in response to up peak traffic conditions, forcing cars from selected zones in the low end of the building to the highest floor of the building in response to down peak traffic conditions, and issuing stop commands to each car in response to said signals indicative of conditions of said car indicating that the committable floor position of said car coincides with the floor landing of an empty zone or a hall call for which a zone demand signal has been provided to said car;

each of said elevators including a car, car motion means for providing and arresting the motion of said car, means registering car calls for service required by passengers therein, and a car controller means for providing signals indicative of conditions of said car, for controlling said car motion means to cause said car to move in a selected up or down direction and to stop in response to said signals indicative of conditions of said car and to signals received from said group controller means;

characterized by said signal processing means comprising means for establishing a cars-to-floors mode of operation in response to up peak traffic conditions, or down peak traffic conditions, or the absence of any registered hall calls, for alternatively establishing a calls-to-cars mode of operation in response to the presence of registered hall calls and the absence of up peak and down peak traffic conditions, for providing said zone control over the cars when in said cars-to-calls mode of operation, and operative when in said calls-to-cars mode of operation for assigning any registered hall call to any one of said cars in dependence on the floor and direction of each hall call and conditions of each car, including the location and direction of travel of such car and the service to be performed by such car in advance of being able to service such hall call, and for issuing group hall stop demands to each car in response to said signals indicative of conditions of such car indicating that such car has a committable floor position which coincides with a hall call at a floor assigned to such car.

4,401,191

UPRIGHT FOR LIFT TRUCK

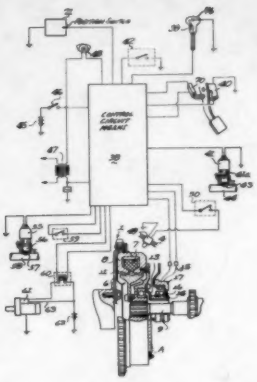
Richard J. Bartow, Athens, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 28,291, Apr. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 17,779, Mar. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 842,765, Oct. 17, 1977, abandoned. This application Aug. 11, 1980, Ser. No. 176,742

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **21 Claims**

1. In an upright structure for lift trucks and the like having a fixed upright section including transversely spaced vertical rails, first, second and third telescopic upright sections each including transversely spaced vertical rails mounted for elevation relative to each other, the improvement comprising a sole asymmetric lift cylinder means mounted in the upright structure which is operatively connected to said first, second and third telescopic sections, said operative connection including elongated flexible lifting structure operatively connected to said lift cylinder and to said first, second and third telescopic sections, a first portion of said flexible lifting structure having one end structure thereof secured a substantial distance outwardly of one side only of the lift cylinder in a direction which includes a lateral component and having the other end structure thereof secured to one of said telescopic sections and a second portion of said flexible lifting structure being connected to the other two of said telescopic sections, said lift cylinder together with said flexible lifting structure being adapted to elevate said third section relative to said second section, said second section relative to said first section and said first section relative to said fixed section, the lift cylinder being located a substantial distance toward one lateral side of the upright structure such that it projects at least partially into the area of interference by an adjacent vertical rail with the visibility of



the operator from his normal line of sight through said adjacent vertical rail, said normal line of sight being defined when the operator is located in a predetermined designed position and attitude for normal operation of the lift truck.

4,401,192

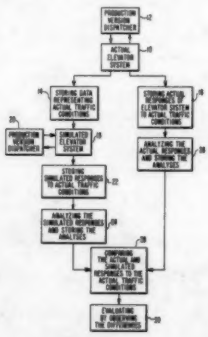
METHOD OF EVALUATING THE PERFORMANCE OF AN ELEVATOR SYSTEM

William J. Trosky, Wilkinsburg, and Michael C. Buros, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 6, 1981, Ser. No. 309,281

Int. Cl.³ B66B *3/00*

U.S. Cl. 187—29 R **11 Claims**



1. A method of evaluating the performance of an elevator system, comprising the steps of:

monitoring predetermined parameters of an operative elevator system,

obtaining and storing data via said monitoring step representative of actual traffic conditions,

obtaining and storing data via said monitoring step representative of the actual response of the elevator system to the stored traffic conditions,

providing a simulator which simulates the operation of an elevator system having the same building configuration, number of elevator cars, and speed of the cars, as the operative elevator system, and which generates data rep-

resentative of the proper response of the elevator system being simulated in response to traffic conditions applied thereto as inputs,

operating the simulator using the stored data representative of the actual traffic conditions as inputs,

obtaining and storing the data provided by the simulator which is representative of the response of the simulated elevator system to the actual traffic conditions,

and comparing data representative of the actual response of the operative elevator system with the data representative of the response of the simulated elevator system to the same actual traffic conditions, as an aid in evaluating the performance of the operative elevator system.

4,401,193

APPARATUS FOR LOCKING A DRIVE SHAFT FOR THE ELEVATION OR AZIMUTH SIGHTING MOVEMENTS OF THE SIGHTING DEVICE OF AN OBSERVATION PERISCOPE

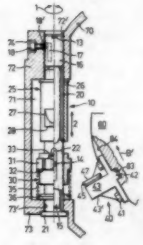
Klaus Arndt, Zurich, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed Apr. 13, 1981, Ser. No. 253,653

Claims priority, application Switzerland, Apr. 30, 1980, 3335/80

Int. Cl.³ F16D *65/30*

U.S. Cl. 188—69 **7 Claims**



1. An apparatus for locking essentially free of play a component which can be positioned in a defined position, especially for locking a drive shaft rotatably mounted in a housing and intended for the elevation or azimuth movements of a sighting device of an observation periscope and positionable in a predetermined rotational position, comprising:

a drive shaft rotatable in a predetermined plane of rotation;

a first pivotable locking element and a second pivotable locking element for locking said drive shaft in said predetermined rotational position;

said first locking element being structured to define a hard layer and said second locking element being structured as resilient impact means;

each of said first and second locking elements being pivotable out of a rest position into the rotational plane of the drive shaft;

a radially outwardly directed impact element attached to said drive shaft;

a compression spring exerting a restoring force upon said second locking element; and

said first locking element, said radially outwardly directed impact element and said second locking element being acted upon in succession by the restoring force of said compression spring, in order to lock said drive shaft in a defined position essentially free of play.

4,401,194

PIN GUIDE FOR SLIDING CALIPER DISC BRAKES

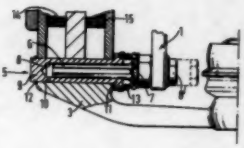
Horst W. Klassen, St. Sebastian, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 18, 1981, Ser. No. 236,175

Claims priority, application United Kingdom, Feb. 26, 1980, 8006339

Int. Cl.³ F16D *65/09*

U.S. Cl. 188—73.44 **13 Claims**



1. A disc brake comprising a torque-taking member, a caliper member, and a friction pad assembly, the caliper member being slidable relative to the torque-taking member by means of at least one pin connection, each pin connection having a pin which is secured to one of said members and is axially slidably engaged in a bore in a pin guide secured to the other of said members, the pin guide also providing a support surface for said friction pad assembly, said pin guide being separable from said torque-taking and caliper members and at all times being interposed between said pin and said other of said members throughout the range of movement of said pin relative to the other of said members.

4,401,195

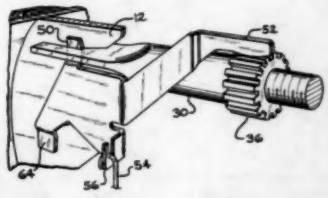
AUTOMATIC BRAKE ADJUSTER

Larry L. Last, Ypsilanti, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed May 18, 1981, Ser. No. 264,262

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—79.5 P **11 Claims**



1. An internal shoe drum brake comprising: a pair of opposing brake shoes having adjacent head ends and adjacent heel ends; an actuator for moving said head ends apart: a strong shoe return spring adjacent said actuator with one end connected to one shoe and the other end connected to the other shoe; an expansible star wheel actuated strut for limiting retractile movement of said head ends of said brake shoes; and which brake further includes a two part expansible assembly formed by one of the shoes and a shoe applying lever pivoted thereto for expanding against one end of the strut; an adjuster lever having a finger with a first abutment surface thereon for engaging the star wheel; said adjuster lever having a finger with a first abutment surface thereon for engaging the star wheel; said adjuster lever having a pivotal abutment spaced apart from said finger for hooking through a receiving hole in one of the shoes or one of the two parts of the expansible assembly adjacent one end of said strut, said adjuster lever having a third abutment for abutting either the adjacent end of the strut, or the other one of the two parts of the expansible

assembly which abuts the adjacent end of the strut, said adjuster lever also having a fourth abutment surface for receiving a spring force, said fourth abutment surface projecting laterally outwardly from said adjuster; and spring biasing means interpositioned between said fourth abutment surface and other structure of the brake for biasing said finger rotationally toward the center line of said star wheel while at the same time forcing said finger and pivotal abutment laterally against said star wheel and portion of the brake to which said adjuster lever is pivoted, the structure of said brake being constructed and arranged with clearance for said adjuster lever to be rotated to a position below the strut where said spring biasing means can be coupled between said adjuster lever and said other structure of said brake and then rotated to a position above said strut to tension said spring means and following which release of said adjuster lever brings said finger into position against said star wheel, and following which said spring means rotates said star wheel when said actuator removes the force of said shoe return spring from said strut.

4,401,196

HYDRAULIC VIBRATION DAMPER WITH NOISE REDUCTION DAMPING VALVES

Manfred Grundei, Niederwerrn, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,395

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015596

Int. Cl.[3] **F16F** *9/348, 9/34*

U.S. Cl. 188—282 **12 Claims**

1. A hydraulic vibration damper unit comprising

(A) a cylinder member (1) having an axis and two ends defining a cavity (8, 9) therein; said cavity containing a fluid;

(B) a piston rod member (2) passing through one of said ends along said axis and being movable in an inward and an outward direction along said axis;

(C) a piston unit fixed to said piston rod member (2) within said cavity (8, 9) and dividing said cavity (8, 9) into two working chambers (8, 9) consisting of a first working chamber (8) adjacent one of said ends of said cylinder member (1) and a second working chamber (9) adjacent the other of said ends of said cylinder member (1), said piston unit comprising

(a) a piston member (3);

(b) first passage means between said working chambers (8, 9);

(c) second passage means (22, 15, 17, 18) between said working chambers (8, 9), said second passage means (22, 15, 17, 18) including at least one substantially axially directed bore (22) through said piston member (3), said bore (22) having a first end adjacent said one end of said cylinder member (1) and a second end remote from said one end of said cylinder member (1);

(d) check valve means operatively associated with said second passage means (22, 15, 17, 18) and increasingly opening said second passage means in response to outward movement of said piston unit, said check valve means comprising

(d_1) an annular valve seat (16) on said piston member (3) radially outwardly of said second end of said bore (22);

(d_2) an annular disc member (14) substantially perpendicular to said axis substantially covering said second end of said bore (22), said annular disc member (14) being axially fixed with respect to said piston member (3) radially inwardly of said second end of said bore (22) and being yieldingly biased into contact with said annular valve seat (16), said annular disc member (14) being provided with at least one opening (15);

(d_3) an annular plate member (11) substantially perpendicular to said axis adjacent said annular disc member (14) on the side thereof remote from said annular valve seat (16), said annular plate member (11) being provided with an axial projection (13) engaging said annular disc member (14) along a circle substantially following said annular valve seat (16) and with an annular recess (17) radially inward of said annular projection (13), said annular recess (17) having a bottom face (12) spaced from said annular disc member (14) and being opposed to said opening (15), at least one substantially axially directed channel (18) being provided between said annular recess (17) and said second working chamber (9) at a location radially inward of said opening (15), said annular plate member (11) being axially movable and urged into a closing position by spring means (25) urging said projection (13) into contact with said annular disc member (14), said annular disc member (14) and said annular plate member (11) being movable away from said annular valve seat (16) by deflection of said annular disc member (14) and axial movement of said annular plate member (11) in response to increase of fluid pressure in said first working chamber (8) above the level of fluid pressure in said second working chamber (9) by a predetermined amount.

4,401,197

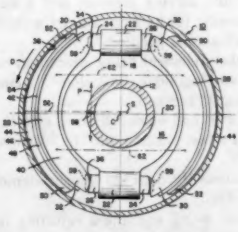
DRUM BRAKE

David J. Bohla, Lakeview, Ohio, and Leonard R. Elliott, Redford Township, Wayne County, Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,605

Int. Cl.[3] **F16D** *51/30*

U.S. Cl. 188—334 **5 Claims**



1. An improved drum brake for a wheel rotatably mounted on a vehicle axle of the type which includes a drum mounted for rotation with said wheel, a brake spider having a center line and a transverse line perpendicular thereto, said spider being

mounted on said axle and having a pair of actuator means mounted at opposite ends of said center line of said brake spider, each said actuator means having an actuation end and an anchor end, an arcuate brake shoe extending from said actuation end of each said actuator means to said anchor end of the other said actuator means, each said brake shoe being capable of limited movement along a path generally parallel to said center line of said brake spider between said actuation end and said anchor end, said wheel and said drum rotating in a normal direction from said actuation end of each said actuator means to said anchor end of said other actuator means so that a leading end of each said brake shoe is adjacent said actuation end and a trailing end of each said brake shoe is adjacent said anchor end, wherein said improvement comprises:

a lining on each said brake shoe which has a useable layer thereof which is thicker at said trailing end of said brake shoe than at said leading end of said brake shoe; and

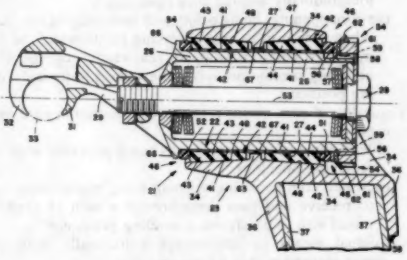
said brake shoe being relatively located on said path toward said actuation end prior to wear of said useable layer of said lining and tending to be relocated along said path away from said actuation end during wear of said useable layer of said lining throughout the life of said drum brake.

4,401,198

FRICTION-BASED, MOTION DAMPING ASSEMBLY FOR A CHAIRLIFT OR THE LIKE

Jan K. Kunczynski, 2400 Arrowhead Dr., Carson City, Nev. 89701

Filed Mar. 30, 1981, Ser. No. 249,003
Int. Cl.³ F16F 7/10
U.S. Cl. 188—379 **3 Claims**



1. An adjustable, low-wear, friction-based, rotational motion damping assembly for a chairlift or the like having a weight supporting arm means freely depending from and rotatably mounted to a hub assembly, said motion damping assembly being coupled to damp relative rotational movement between said arm means and said hub assembly and including sleeve means mounted concentrically to and in sliding frictional engagement with a surface on one of said hub assembly and a portion of said arm means and said sleeve means and said surface are formed for a low coefficient of sliding friction therebetween; annular rubber block means mounted concentrically to and in engagement with said sleeve means and being further mounted for support with respect to a remainder of said hub assembly and said portion of said arm means; and adjustable load inducing means mounted in engagement with said bock means and formed to induce a radial compressive load in said block means against said sleeve means and against said remainder of said hub assembly and said portion of said arm means which is sufficiently high to be effective in damping the rotational movement of the freely depending arm means within a relatively small number of arm swings, wherein the improvement in said motion damping assembly comprises:

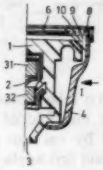
said portion of said arm means is provided as a collar and said load inducing means includes a radially inwardly tapered, smooth surface on said collar and means for urging said block means against said tapered, smooth surface in a direction inducing said radial compressive load, said block means being tapered to mate with said tapered, smooth surface.

4,401,199

ELECTRO-MAGNETIC CLUTCH CONTROL SYSTEM FOR AUTOMOBILES

Toshio Takano, Hamuramachi; Kazutaka Mihashi, Tokyo, and Kohichi Arasawa, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,672
Claims priority, application Japan, Mar. 15, 1980, 55-33005
Int. Cl.³ B60K 41/28
U.S. Cl. 192—0.052 **2 Claims**



1. A system for controlling an electro magnetic clutch of an internal combustion engine mounted on a vehicle, which has a drive member secured to a crankshaft of said internal combustion engine, a magnetizing coil provided in said drive member, a driven member adjacent said drive member, a transmission secured to said driven member having multi-stage change gears, and a shift lever for operating said transmission, comprising

a shift lever switch means for producing a signal during the operation of said shift lever for disconnecting the magnetizing coil;

a sensor means for detecting the speed of said vehicle and for producing a signal when the speed exceeds a predetermined value;

a clutch hold switch means for producing a signal when the speed of the engine exceeds a predetermined value; and

control means for overriding said shift lever switch means keeping current flowing through said magnetizing coil when said sensor means and said clutch hold switch means produce respectively output signals.

4,401,200

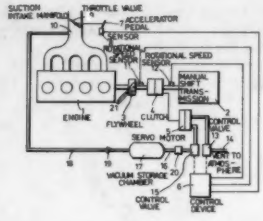
ARRANGEMENT FOR AUTOMATIC CLUTCH ACTUATION

Paulus Heidemeyer; Erhard Bigalke, both of Wolfsburg; Frank Zimmermann, and Hartmut Werner, both of Braunschweig, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,072
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946497
Int. Cl.³ B60K 41/02
U.S. Cl. 192—0.076 **6 Claims**

1. In an arrangement for the automatic actuation of an automobile clutch operatively located between an automobile engine and a manually shiftable transmission, of the kind that includes a servo motor responsive to auxiliary power applied thereto for effecting engagement and disengagement of the clutch, and control means for controlling the auxiliary power delivery to the servo motor as a function of at least one of the speed adjusting means, and the clutch input and output rotational speeds, and wherein the control means controls the auxiliary power delivery to the servo motor so that the rotational speed of the engine attains a prescribed rotational speed that is a function of accelerator pedal position; the improvement wherein said servo motor is a vacuum responsive control

motor and said control means for controlling auxiliary power delivery to the said servo motor comprises means for providing a first application pulse of sufficient duration to almost completely overcome the free travel of the clutch to the instant at which the friction elements of said clutch begin to engage, the arrangement further comprising a vacuum pressure storage



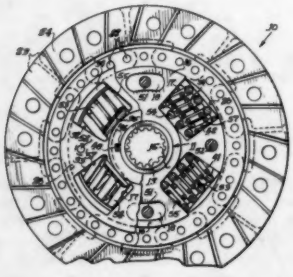
means and engine suction tube means connecting said storage means with the intake manifold of said engine, said servo motor being activated by vacuum pressure storage means, wherein the length of said first application pulse is selected on the basis of the smallest possible vacuum present in said vacuum storage pressure means.

4,401,201

CLUTCH DRIVEN PLATE ASSEMBLY

Sidney U. Gatewood, Roseville, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1980, Ser. No. 219,271
Int. Cl.³ F16D *3/14*
U.S. Cl. 192—106.2 **7 Claims**



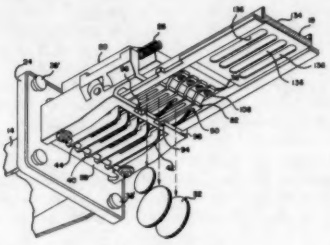
1. In a clutch plate assembly comprising a hub having a radial flange, a clutch driven plate carrying oppositely disposed friction facings, a pair of spring retainer plates axially spaced apart and encompassing said hub flange and clutch driven plate therebetween, said spring retainer plates having a plurality of axially aligned spring windows therein, and damper springs received in each aligned set of windows, the improvement comprising that said damper springs and windows are unequally spaced about the circumference of said plates, a pair of oppositely disposed radially extending hub arms located between pairs of adjacent damper springs, and said clutch driven plate having a pair of oppositely disposed elongated arcuate windows encompassing said pairs of damper springs.

4,401,202

COIN SLIDE WITH INTERCHANGEABLE CORES

Harvey S. Gitlin, Ambler, and John J. Duffy, Glenside, both of Pa., assignors to Equipment Systems and Devices, Inc., Philadelphia, Pa.

Division of Ser. No. 152,684, May 23, 1980, Pat. No. 4,350,240.
This application Feb. 12, 1982, Ser. No. 348,172
Int. Cl.³ G07F *5/06*
U.S. Cl. 194—55 **6 Claims**



1. In a coin slide of the type including a body having a medial flange and a lever checking mechanism affixed rearwardly of the flange and being adapted to be mounted to function a vending machine, the combination of

a slide movable relative to the body between a coin receiving position and a vending position,

the slide having a forwardly positioned handle and a rearwardly positioned core area,

the slide core area being provided with a plurality of longitudinally aligned core openings,

the core openings being positioned forwardly of the flange when slide is in its coin receiving position and the core openings being positioned rearwardly of the lever checking mechanism when the slide is in its said vending position;

a plurality of core means respectively secured in core openings,

at least some of said core means being provided with coin receiving openings,

each said coin receiving opening being respectively sized to receive and pass therethrough a coin of predetermined size to determine a vending price; and

individual means to interchange individually each core means secured within a core opening,

said individual means to interchange comprising a removable fastener for individually interconnecting each core means to the slide,

the said fasteners being exposed rearwardly of the lever checking mechanism when the slide is moved to the vending position,

whereby the vending price may be changed without removing the slide from association with the body.

4,401,203

PARTS FEEDING BOWL WITH ORIENTING MEANS

Walter McDonald, 558 Dell Rd., Landing, N.J. 07850, and Norbert F. Seitel, 45 Gillette Rd., Gillette, N.J. 07933

Filed Oct. 21, 1981, Ser. No. 313,574
Int. Cl.³ B65G *29/00*
U.S. Cl. 198—392 **16 Claims**

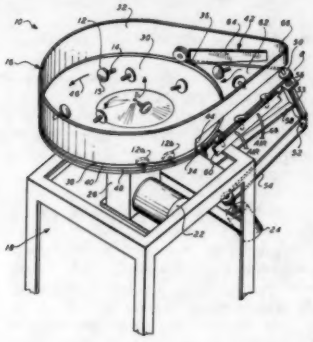
1. Apparatus for accepting an initially presented population of random articles of the type including an elongated narrow portion adjoined to an enlarged base portion, and providing a high speed output stream, wherein all said articles are commonly oriented for further mechanical manipulation; said apparatus comprising:

an input bowl for accepting said articles, said bowl including a rotatable central disk for feeding said articles rendered incident thereupon to the periphery of said disk;

a continuous wall member rising upwardly from a point adjacent the periphery of said disk and extending about a major arced zone of said disk; the bottom of said wall member being spaced from the disk periphery to define a gap through which the elongated portions of said articles may protrude while the bases of same continue to ride said disk periphery in sliding contact with the inner surface of said side wall;

an output section for receiving and delivering said articles from said disk, being defined at said apparatus adjacent the periphery of said disk, at the portion thereof opposed to said major arced zone;

a continuous conveying band extending about the periphery of said disk, said band and said articles moving in the direction of disk rotation at said arced zone;



said band separating from said disk periphery beyond said major arced zone and extending into said output section;

said wall member having an opening at said output section where said band separates from said disk, for permitting said articles to leave said disk and said bowl with said band;

means cooperating with said band at said output section to constrain said articles between said band and said means, whereby said articles are carried into said output section; and

said band diverging from said cooperating means at the end of said output section to release said constrained articles for said further mechanical manipulation.

4,401,204

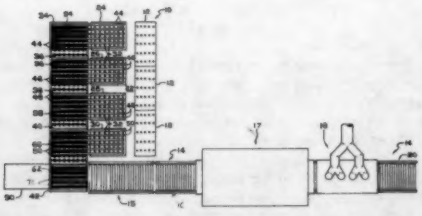
ASSEMBLY SYSTEM FOR LOADING GLASS SHEETS OF DIFFERENT SIZE ON A CONVEYOR

Michael P. Roseman, Pittsburgh, Pa.; Richard C. Eames, Dallas, Tex., and Marlin W. Barrett, Bethel Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 22, 1981, Ser. No. 228,421

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—431 **8 Claims**



1. A method of arranging randomly dimensioned sheets to provide a more efficient use of the surface area of a treatment conveyor by forming groups of sheets in non-contacting arrangement for feeding said groups to a treatment conveyor in such a manner that the sheets comprising said groups occupy a greater proportion of a given surface area along said treatment conveyor than when said sheets of random dimensions are fed consecutively into said given surface area, said method comprising:

providing a consecutive supply of randomly dimensioned sheets to a delivery station,

transferring from said delivery station said individual sheets which can be of random outline and area in non-contacting relation onto any of several congruent loading tables having said given surface area in such a manner that said sheets placed on any one of said loading tables are arranged as a group in an arrangement to cover at least a greater proportion of said given surface area than would be covered by consecutive sheets placed in consecutive order onto a single one of said loading tables, any sheets too large to fit within a group being placed onto another loading table, and

transferring said group of sheets from said loading table to said treatment conveyor after said group is so arranged and without changing said arrangement.

4,401,205

APPARATUS FOR SUPPLYING PARTICLES OF TOBACCO TO THE COMMINUTING STATION OF A SHREDDING MACHINE

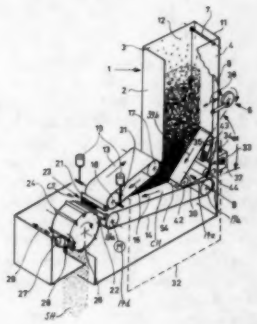
Werner Komossa, Börnsen, and Gerhard Ramsch, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 220,096

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1980, 3000153

Int. Cl.³ B65G *43/08, 47/20*

U.S. Cl. 198—524 **44 Claims**



1. Apparatus for supplying particles of tobacco to the comminuting station of a tobacco cutting machine, comprising a pair of tobacco advancing and compacting conveyors defining a substantially horizontal channel having a tobacco receiving end remote from and a tobacco discharging end adjacent to said station; means for driving at least one of said conveyors at a first speed and in a direction to advance the particles of tobacco entering the channel by way of said receiving end toward and beyond said discharging end; means for feeding particles of tobacco to the receiving end of said channel, including a substantially upright duct disposed above said channel and having a tobacco admitting upper portion and a tobacco discharging lower portion adjacent to the receiving end of said channel, said duct including a front wall nearer to and a rear wall more distant from said station and said rear wall including a tobacco deflecting conveyor and a variable-speed

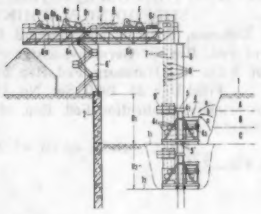
prime mover for driving said deflecting conveyor at a second speed exceeding said first speed and in a direction to advance particles of tobacco from the interior of said duct toward the receiving end of said channel; and control means for regulating the speed of said prime mover, including means for monitoring a dimension of the cake in the region of said comminuting station and for generating signals denoting the monitored dimension.

4,401,206

ARRANGEMENT FOR CONTINUOUSLY EXCAVATING GROUND AND CONVEYING EXCAVATED EARTH IN THE VERTICAL DIRECTION

Satoshi Ikeda, Tokyo, Japan, assignor to Shinko Kiko Co. Ltd., Tokyo, Japan

Division of Ser. No. 132,117, Mar. 20, 1980, Pat. No. 4,306,364.
This application Apr. 3, 1981, Ser. No. 250,717
Claims priority, application Japan, Dec. 14, 1979, 54/162556
Int. Cl.[3] B65G *17/36, 47/18*
U.S. Cl. 198—549 4 Claims



1. An apparatus for excavating a portion of ground, comprising:

guide post means for being driven vertically into the earth deeper than a predetermined depth to be excavated;

a lower earth loading mechanism for receiving earth removed from the portion of ground being excavated;

means for slidably securing said lower earth loading mechanism to said guide post means so that said loading mechanism can be placed at any vertical height along said guide post means down to a current level of excavation;

means for vertically conveying earth previously deposited in said lower earth loading mechanism said vertical conveying means including

an endless chain;

a plurality of chain wheels including a horizontally movable chain wheel substantially at an upper portion of said vertical conveying means said horizontally movable chain wheel permitting the extension or drawing in of said endless chain;

a plurality of containers carried by said chains;

an upper earth discharging mechanism, disposed substantially horizontal to said guide post means and to said vertical conveying means for horizontally conveying earth, vertically conveyed by said vertical conveying means, to a predetermined dumping place; and

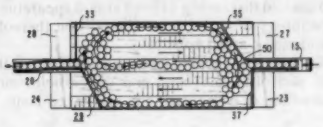
means, coupled to said lower earth loading mechanism, for holding lower portions of said chain after it has been cut in preparation for adding chain links thereto to extend the length of said chain when said lower earth loading mechanism is to be lowered along said guide post means to a new excavating depth.

4,401,207

PRODUCT ACCUMULATOR

Francis J. Garvey, Newfield, N.J., assignor to Garvey Corporation, Blue Anchor, N.J.

Continuation of Ser. No. 970,819, Dec. 18, 1978, abandoned.
This application Jan. 26, 1981, Ser. No. 228,360
Int. Cl.[3] B65G *37/00*
U.S. Cl. 198—580 4 Claims



1. A product accumulator for a conveyor system comprising the combination of

a through-lane conveyor for moving articles in one direction in the conveyor system,

first auxiliary conveyor means including at least one first auxiliary conveyor parallel and along a first side of the through-lane conveyor for moving articles in the same direction as the through-lane conveyor,

second auxiliary conveyor means including at least one second auxiliary conveyor parallel and along a second side opposite the first side of the through-lane conveyor for moving articles in the opposite direction from the through-lane conveyor,

said conveyors defining a planar accumulating area having input and output sides thereof,

input guide means over an upstream portion of the through-lane conveyor defining an input opening into the input side of the planar accumulating area,

output guide means over a downstream portion of the through-lane conveyor defining an output opening from the output side of the accumulating area,

a first angular guide extending across the first auxiliary conveyor means at the output side of the accumulating area and terminating at a point over the through-lane conveyor wherein the termination point of the first angular guide is spaced upstream from the output opening of the accumulating area for directing articles from the first auxiliary conveyor means to the through-lane conveyor, and

a second angular guide across the second auxiliary conveyor means at the input side of the accumulating area and terminating at a point over the through-lane conveyor wherein the termination point of the second angular guide is spaced downstream from the input opening of the accumulating area for directing articles from the second auxiliary conveyor means to the through-lane conveyor.

4,401,208

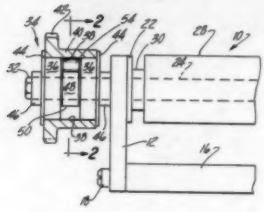
ACCUMULATING CONVEYOR SYSTEM

Daniel S. Allmacher, Jr., 38531 Manchester, Mt. Clemens, Mich. 48043

Filed Apr. 13, 1981, Ser. No. 253,411
Int. Cl.[3] B65G *13/06*
U.S. Cl. 198—781 18 Claims

1. An accumulating conveyor system comprising conveyor roller means, continuously operative torque limiting means for transmitting torque to said roller means to rotate the same when the torque required to rotate the roller means is less than a predetermined maximum and for avoiding the transmission to said roller means of torque impulses greater than said predetermined maximum when the torque required to rotate the roller means exceeds said predetermined maximum comprising driving means having a cylindrical driving surface, driven means operatively connected with said roller means for rotating the same and having a cylindrical driven surface, said cylindrical driving and driven surfaces being arranged for rotation about

a common axis with said cylindrical surfaces one within the other to provide a space therebetween extending around said axis and decreasing in opposite circumferential directions for at least approximately 90° about said axis from a maximum radial dimension to a minimum radial dimension, means within said space for rotating said driven means in response to rotation of said driving means when the torque required to rotate said roller means does not exceed said predetermined maximum and for enabling continuous independent rotation of said driving



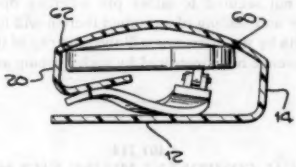
means with respect to said driven means when the last named torque exceeds said maximum comprising a resiliently yieldable torque transmitting member in frictional torque transmitting engagement with said surfaces, said member being dimensioned to effect a preloaded interference fit between said surfaces and being resiliently deformed by said fit for transmitting driving torque from said driving to said driven surface and being relatively movable with respect to at least one of said surfaces to enable said independent rotation of said driving means when said torque exceeds said predetermined maximum.

4,401,209

SPECTACLE CASE

Andrea Salmond; Patricia St. John, both of Long Beach; Randall A. Luebke, and Jeffrey B. Van Tassel, both of Huntington Beach, all of Calif., assignors to Rods and Cones, Inc., Long Beach, Calif.

Filed Sep. 21, 1981, Ser. No. 303,730
Int. Cl.³ A45C *11/04*
U.S. Cl. 206—5 **25 Claims**



1. An improved spectacle case which is adapted to securely hold a spectacle within it to protect the spectacle from damage by either internal or external forces, wherein the improved spectacle case comprises:

a. a rectangular sheet member that is bent into five longitudinal sections with the fifth section partially overlapping the first section;

b. the first section forming a flat base which is wider than the vertical height of the frame front of a spectacle to be housed within said improved spectacle case;

c. the second section extending essentially perpendicular to said first section and having a height slightly less than the thickness of the spectacle when in its folded position;

d. the third section extending essentially perpendicular to said second section and generally parallel to said base, and being convexly curved in the direction away from said base;

e. the fourth section extending from said third section and parallel to said second section, but not extending to said base and leaving a gap therebetween; and

f. the fifth section extending inwardly from said fourth section and parallel to said flat base, thereby forming a partial separation wall which partially separates the interior of the improved spectacle case into a chamber and a gap area;

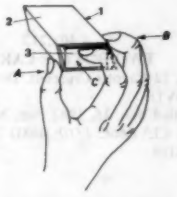
g. wherein the partial separation wall produces a large chamber which is intended to receive the frame fronts, lenses, bridge, nose supports, and most of both temples of the spectacle, and a gap area which is intended to receive the tips of both temples and a portion of each temple of the spectacle.

4,401,210

CHILD-PROOF CONTAINER

Gunnar Anjou, Västra Frölunda, Sweden, assignor to Safe Package AB, Gothenburg, Sweden

Filed Nov. 25, 1981, Ser. No. 324,974
Claims priority, application Sweden, Nov. 27, 1980, 8008311
Int. Cl.³ A45C *13/10*
U.S. Cl. 206—1.5 **6 Claims**



1. A child-proof container of the type comprising a box, which is displaceable in a casing and with locking members adapted to lock the box to the casing in the position where the box is entirely pushed into the casing said locking members being releasable from their locking positions, characterized thereby that the casing at the inner side of its long side walls is provided with projections, projecting inwards and forming said locking members, which are arranged to engage under locking into recesses in the long side walls of the box in the position where the box is entirely pushed into the casing, whereby said projections in the two opposite casing long sides are located mainly diagonally opposite to each other, whereby the casing is arranged, under influence of external pressure forces (A,B) to be given a mainly rhomboidic cross-section, at least in the area of said projections in the purpose of releasing said projections from said recesses during the time of action of said pressure forces and thereby to allow the opening of the box.

4,401,211

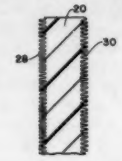
MULTIPLE CONTAINER CARRIER AND PACKAGE

Harry F. Pillman, Barrington, and H. Carl Recknagel, Arlington Heights, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 18, 1982, Ser. No. 435,002
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—150 **7 Claims**

1. A multi-package comprising a plurality of containers arranged in a closely spaced array, each container having substantially cylindrical side-walls and including chime means at an extremity defined as a top extremity, a carrier device formed from a resilient deformable plastic sheet material, elastically gripping predetermined regions of the side-walls of the containers and unitizing them into said array, the device including a plurality of bands interconnected by web means,

each of the bands stretchingly gripping a container in a predetermined region beneath a chime, each band further being stretched at least approximately 15% of its original unstretched dimension so that a flat surface region of each band



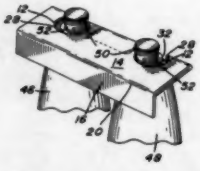
is in tight surface area to surface area contact with the predetermined region on the container, the surface of the band which is in stretching contact with said predetermined region having a surface finish which is not less than approximately 16–18 in roughness average.

4,401,212

TWO BOTTLE CARRIER

David Fischer, 12 Cavotti Crescent, Downsview, Ontario, Canada (M3H 4V1)

Filed Feb. 25, 1982, Ser. No. 352,175
Int. Cl.³ B66C *1/10*; B65D *75/00, 85/62*
U.S. Cl. 206—158 **6 Claims**



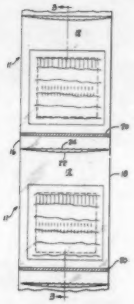
1. A bottle carrier comprising first and second panels interconnecting via longitudinally extending fold line, a first pair of aperatures spaced longitudinally in said first panel symetrically positioned on opposite sides of a line extending substantially perpendicular to said fold line, the second pair of aperatures larger than said first pair of aperatures in said second panel, said second pair of aperatures being spaced longitudinally in said second panel symetrically on opposite sides of said transverse line, connecting passage means transversing said longitudinal fold line and connecting adjacent of said first and second aperatures, each of said connecting passage means sloping from said first aperature toward said second aperature in a direction away from said transverse line, a portion of the boundary of each of said passages adjacent said transverse line on said second panel being spaced further from said transverse line than said boundary on said first panel, said aperatures being positioned and sized so that with necks of bottles passing through said first aperatures said second panel may be folded on said fold line into position overlying said first panel with a portion of said necks projecting from one of said first aperatures projecting through the adjacent of said second aperatures and said portion of said boundary of each of said passages in said second panel being positioned to overly the adjacent portion of its said passage in said first panel to reduce the effective width of said passages.

4,401,213

CONTAINER STRIP HAVING INSERTS

Bernard Lerner, Peninsula, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 155,399, Jun. 2, 1980, which is a continuation of Ser. No. 901,996, May 1, 1978. This application Jul. 26, 1982, Ser. No. 401,880
Int. Cl.³ B65D *81/24*
U.S. Cl. 206—205 **6 Claims**



1. An article for use in packaging products comprising:
(a) an elongated tubular web of plastic having a pair of plies:
(b) the web including a series of spaced, transverse seals securing the plies together to delineate a plurality of containers connected together end to end;
(c) the web also including a plurality of spaced lines of weakness with each container having at least one such line of weakness to permit facile separation of each container from the web;
(d) each of the containers including an opening such that the interconnected containers comprise a chain of coilable open bags;
(e) a plurality of flexible inserts each adhered to at least one associated ply and each within a different one of the containers; and,
(f) each of the inserts having a portion secured to its associated ply near an end of the insert which is the insert end nearest the bag opening of the connected bag container and another portion not secured to either ply whereby opening of a container and loading of a product therein will not be interfered with by the insert nor will the integrity of the insert to ply adherence be jeopardized by such opening and loading.

4,401,214

DUAL COMPONENT MIXING PACKAGE

Bent Kleckers, Fredericia, Denmark, assignor to I. C. Moller a/s, Fredericia, Denmark

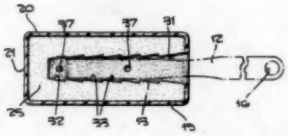
Filed Oct. 7, 1981, Ser. No. 309,483
Claims priority, application Denmark, Oct. 7, 1980, 4220/80
Int. Cl.³ B65D *25/08*; B67B *7/26*
U.S. Cl. 206—219 **11 Claims**

1. A dual component mixing package comprising a bag of a strong and flexible sheet material, means for dividing the bag into at least two compartments, each of said compartments containing the respective components, the bag being manipulatable from outside thereof for bringing together the components in a common portion of the bag, and means manipulatable from outside of the bag for enabling the components to be effectively mixed prior to being emptied from the bag, characterized in that the means for enabling the components to be effectively mixed includes a mixing tool including an elongate stirring rod located entirely inside one of the individual com-

partment such that one end of the stirring rod is manually seizable from the outside of the bag while an opposite end

thereof is freely projectible into said common portion of the bag.

4,401,215
PROTECTIVE BRUSH HOLDER
Remi T. Kramer, Rte. #2, Box 262B, Sandpoint, Id. 83864
Filed Jan. 4, 1982, Ser. No. 337,029
Int. Cl.³ A65D *44/18*
U.S. Cl. 206—362.3 **1 Claim**



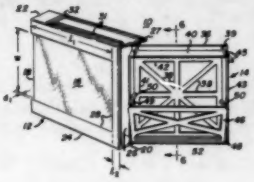
1. A protective holder for a brush assembly with an elongated handle wherein at a head end of the brush assembly an array of bristles extends transversely to form a brush, said holder comprising a container having a base wall, end walls adjacent opposite ends, side walls intermediate the end walls and a face wall, said walls forming a chamber for reception of the brush, one of said end walls being relatively yieldable and having a slit therein with sides of the slit being of yieldable character and adapted to spread temporarily for admission of the brush into the chamber, there being an elongated recess on the inside face of one of said walls of breadth narrowing progressively from a location adjacent said slit to a location adjacent the end wall at the end of the container opposite said slit for releasable retention of the brush assembly there being stepped configurations on inside faces of said recess for releasable retention of brush assemblies of different breadths.

4,401,216
MEDIA STORAGE DEVICE
Richard C. Koch, 533 Cinnabar Dr., Livermore, Calif. 94550
Continuation-in-part of Ser. No. 90,271, Nov. 1, 1979. This application Jan. 15, 1981, Ser. No. 225,412
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—387 **12 Claims**

1. A device for storing items comprising:

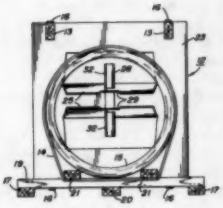
a hollow box of rectangular configuration including opposing right-side and left-side walls, opposing top and bottom walls and a back wall to frame an elongated rectangular front opening and including in the interior thereof means for receiving and guiding a drawer; and

a drawer for slidably fitting into the box in either a first or a second planar orientation, said second planar orientation being substantially perpendicular to said first orientation, the drawer including; a base panel, a first wall, a second wall, a third wall opposing said first wall and a fourth wall, said first, second, third and fourth walls extending substantially perpendicularly from and upon said base panel to form, with said base panel, an open rectangular container, the height of said first and fourth walls being slightly less than the height of said second and third walls,



gate means extending across between opposing points on said first and third walls to restrain the contents of the drawer, and slide means for engaging the interior of the box such that the drawer slides smoothly in and out of the box in said first and second orientations.

4,401,217
ROLL RETAINER
David H. Blatt, Elkins Park, Pa., assignor to Franklin Container Corporation, Philadelphia, Pa.
Filed Mar. 4, 1981, Ser. No. 240,318
Int. Cl.³ B65D *85/66*
U.S. Cl. 206—408 **1 Claim**



1. A retaining package for open ended hollow cylindrical rolls of material made of erectable and collapsible components which when not in erected use condition are flat stackable for high density return shipment of the package for subsequent re-use, comprising in combination,

(a) a bottom support structure upon which the cylindrical roll is seatable, said support structure comprising an essentially planar rigid frame rectangular pallet having a pair of parallel widthwise extending opposite end members intersecured by lengthwise extending side members,

(b) a pair of opposite end pads supported respectively on said pair of opposite end members, each said end pad being constructed of multiple layers of corrugated paperboard fixedly secured together, one end layer of each pad having a pair of apertured trapezoidal flaps turned out of the plane thereof about parallel hinging lines which form the longer trapezoidal base of each flap so that the flaps are foldable away from the plane of the end pad toward the center of the pad and toward one another with the edges of said flaps formed by the shorter trapezoidal base being positioned in spaced apart relation to one another with the flaps inclined toward one another, and a rigid brace tube removably intersecurable with said pair of flaps of each pad effective to hold said flaps fixed in their inclined position, said brace tube extending between said flaps and through said flaps apertures and having end retainer sections positionally adjustable to interlock said tube with said flaps and hold the latter in fixed position, said oppo-

site end pads being oriented so that the said flaps of each pad face toward the flaps of the other pad and are insertable axially within the opposite open end of the hollow cylindrical roll of material to be packaged with the trapezoidal sides of at least one flap of each pad being engaged with the inside of each end of the hollow roll, and

(c) securing means for fixedly securing together said end pads and bottom support pallet.

4,401,218

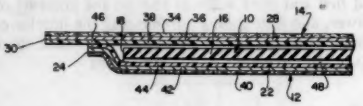
PACKAGE FOR HERMETICALLY STORING A SHRINKABLE ELASTOMERIC SLEEVE

Max Erlichman, Sunnyvale, Calif., assignor to Insulation Systems, Inc., Sunnyvale, Calif.

Filed May 7, 1982, Ser. No. 375,815

Int. Cl.³ B65D *85/20*

U.S. Cl. 206—446 **9 Claims**



1. A package for hermetically storing a protective elastomeric sleeve which shrinks upon exposure to ambient air, said package comprising:

a pair of tubular pouches, one disposed within the other, to form an inner and an outer pouch;

a chemically dilated elastomeric sleeve of the type which shrinks upon exposure to ambient air, said sleeve being disposed between said inner and outer pouches, with the inner pouch being disposed within the sleeve and the other pouch being positioned over said sleeve;

said sleeve being of shorter length than said pouches, thereby permitting the ends of said pouches to project beyond the ends of said sleeves;

said inner pouch having its ends secured to the interior of said outer pouch to form a closed chamber within which said sleeve is hermetically sealed;

said outer pouch having end portions extending beyond that area where said inner pouch ends are secured;

said outer pouch end portions being sealed closed, thereby sealing the interior of said outer pouch.

4,401,219

APPARATUS AND METHOD FOR HOLDING JEWELRY

Jan B. Mink, 1783 Cable St., San Diego, Calif. 92107

Filed Aug. 31, 1981, Ser. No. 297,943

Int. Cl.³ B65D *75/30*; B65B *15/00*

U.S. Cl. 206—566 **6 Claims**

1. A jewelry storage container which comprises:

a generally planar flexible first web shaped member;

a plurality of compartments defined on said first web shaped member, each compartment being formed from at least one additional web shaped member, at least one side of each of said compartments being selectively closed by means of a band shaped molded hook and loop fastening apparatus;

at least some of said compartments including a plurality of linear attachment connections between said web shaped members to define subcompartments;

said apparatus including a plurality of tying members for securing said apparatus to an associated hanger in addition to a loop and snap for securing said apparatus to an associated hanger; and

means for securing an associated elongated piece of jewelry in at least one of said compartments which comprises band shaped molded hook and loop fastening apparatus for joining axially spaced sections of an associated elongated piece of jewelry at axially spaced intervals of said band shaped molded hook and loop fastening apparatus.

4,401,220

CASSETTE TAPE CASE

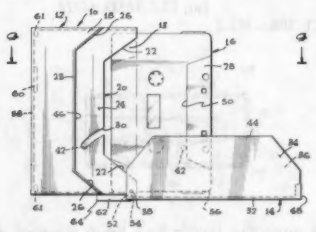
Dong J. Kim, 1710 Morgan La., Redondo Beach, Calif. 90278

Filed May 12, 1981, Ser. No. 262,989

Claims priority, application Rep. of Korea, Dec. 10, 1980, 7947

Int. Cl.³ B65D *43/16*; A47F *1/00*

U.S. Cl. 206—387 **11 Claims**



1. A cassette tape case which comprises a body portion having a open end therein for insertion of a cassette tape, a cover mounted adjacent the open end of said body portion, said cover having a closed end and an open side portion, and arranged to fit over the open end of said body portion to close said case, pin means mounted on said side portion of said cover, said body portion containing slot means for registration with said pin means, said pin means adapted to make contact with a portion of said cassette tape during pivotal motion of said hinged cover from its closed to its open position to pull the cassette tape outwardly and to permit removal of at least a portion of said tape from the body portion of said case through the open side portion of said cover, in the open position of said cover.

4,401,221

FORWARD FEED MERCHANDISING DEVICE FOR SOFT DRINK BOTTLES

James M. Suttles, Elberton, Ga., assignor to The Mead Corporation, Atlanta, Ga.

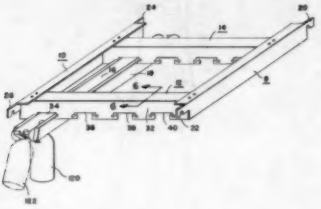
Filed Jan. 30, 1980, Ser. No. 116,977

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—49 D **11 Claims**

1. A merchandising device for bottles having integrally formed externally projecting neck rings comprising track means providing a pair of substantially parallel supporting surfaces having opposed edges spaced from each other to form an elongated slot of substantially uniform width adapted to receive the necks of the bottles in a column of bottles underneath their neck rings, and means for supporting said track means in a fixed position, characterized by the fact that the slot

has an open discharge end permitting bottles to be removed from the slot, by the fact that each of said supporting surfaces comprises a downwardly sloping portion for effecting feed of bottles toward the discharge end by gravity and an upwardly sloping portion following said downwardly sloping portion in the direction of feed of bottles, and by stop means comprising two tabs, one tab projecting upwardly from the upwardly sloping portion of one of said parallel supporting surfaces and the other tab projecting upwardly from the upwardly sloping



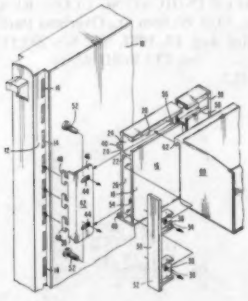
portion of the other of said parallel supporting surfaces for effecting stoppage of a bottle by engagement of its neck ring with said tabs, said tabs projecting upwardly from their respective upwardly sloping portions at angles such as to effect positive stoppage of the foremost bottle in a column of bottles at a predetermined position regardless of the number of bottles in the column, and said tabs projecting upwardly from their respective upwardly sloping portions to an extent such that for removal, a bottle must be manually lifted so that its neck ring clears the tabs.

4,401,222

SUPPORT RAIL

Patricia A. Kulikowski, Wyoming; Allen L. Palmbos, Jenison, and Charles R. Tyke, Cascade, all of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1981, Ser. No. 271,162
Int. Cl.³ A47F 5/00
U.S. Cl. 211—94 **4 Claims**



1. A wall mounted support rail adapted to be mounted to a pair of laterally spaced, vertically oriented slotted standards, said support rail comprising:

an elongated, generally rectangular, rail member including a front wall, a rear wall, a top wall, and bottom wall with a web member interconnecting said front wall and said rear wall dividing the interior of said rail member into an upper cavity and a lower cavity;

an elongated slot in said front wall communicating with said upper cavity, the portion of said front wall above said elongated slot defining a downwardly projecting lip member and the portion of said front wall below said elongated slot defining an upwardly projecting lip member, said downwardly projecting lip member being of a greater thickness than said upwardly projecting lip member; and

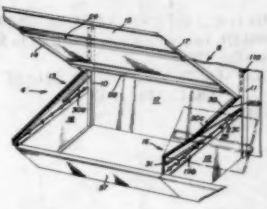
a pair of mounting clip means having connector means thereon constructed and arranged to interlock with the slots in said slotted standards, and means for mounting one of said pair of mounting clip means at each end of the rear wall of said rail member.

4,401,223

PITCH ADAPTER UNIT FOR DISPLAY DEVICES

William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 2, 1981, Ser. No. 326,815
Int. Cl.³ A47F 5/00
U.S. Cl. 211—134 **10 Claims**



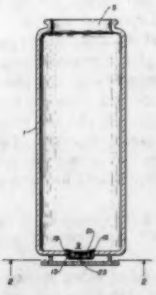
1. A pitch adapter unit for supporting at different angles the base shelves of adjacent display devices, said pitch adapter comprising a pair of vertically disposed pitch adapter plates having top edges which are angularly inclined, vertically disposed center plate means interposed between said pitch adapter plates and secured thereto in flat face contacting relation, the top edges of said adapter plates being inclined in opposite directions and the upper edge of said center plate means being inclined downwardly from each end thereof to a lower level between the ends thereof whereby the top edge of each end of said center plate means coincides approximately with the top edge of one end of different ones of said adapter plates.

4,401,224

FEEDING BOTTLE FOR INFANTS

Ferdinand Alonso, San Leandro, Calif.

Continuation-in-part of Ser. No. 29,618, Apr. 13, 1979, abandoned. This application Sep. 28, 1979, Ser. No. 79,713
Int. Cl.³ A61J 9/04
U.S. Cl. 215—11 B **10 Claims**



1. A feeding bottle assembly comprising a bottle having a bottom with a recessed central portion, said recessed central

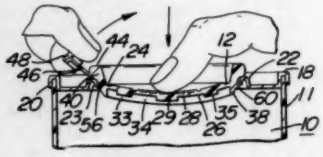
portion having a central passageway and at least one vent aperture to one side of said central passageway, a normally closed valve assembly including a valve seat encircling said central passageway and vent aperture, and a unitary valve and valve stem of like material installed in said recessed area with said valve engaging said valve seat and said stem secured in said central passageway under tension to normally urge said valve into such engagement with said valve seat and with just sufficient force to enable a differential pressure, created across said valve during feeding of an infant from said bottle, to momentarily lift said valve from engagement with said valve seat to admit atmosphere and minimize such differential pressure.

4,401,225

CHILD-RESISTANT CLOSURE UNIT

Ralph A. Schwalkert, Lakeville, Conn., assignor to Rasco Incorporated, Lakeville, Conn.

Filed May 24, 1982, Ser. No. 381,139
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—211 **8 Claims**



1. A child-resistant closure unit which comprises:

(1) a container, said container closed at one end thereof and having a generally circular opening at the other end thereof, the periphery of said opening having a raised downwardly curved surface, and

(2) a resiliently flexible, generally circular, releasable cover for snap-fit engagement with said opening, said cover comprising:

(a) a generally circular planar member, said planar member having a bottom surface and a top surface, said bottom surface having reinforcement means extending through approximately its center in opposite directions towards the periphery thereof,

(b) a first raised rim adjacent the periphery of said planar member on its bottom surface, said first raised rim having a diameter greater than that of said planar member, said first raised rim elevated a distance beyond the bottom surface of said planar member so as to engage the bottom of said curved surface when said cover is engaged in said opening;

(c) a second raised rim adjacent the periphery of said top surface of the planar member, said second raised rim elevated a distance beyond said planar member so as to rest upon said curved surface when said cover is engaged in said opening, and said second raised rim having a diameter greater than that of said planar member and greater than that of said first raised rim;

(d) a flange connecting said first and second raised rims, and

(e) a tab extending outwardly from said first raised rim, said tab generally in alignment with said reinforcing means,

said cover being capable of being pressed in said opening at any rotatable position to close the opening and disengaged by application of sufficient downward force at approximately the center of the planar member, while said tab is simultaneously pulled in a generally upward direction.

4,401,226

VENTING CLOSURE ASSEMBLY

Homer J. Brown, Oreland, Pa., assignor to The West Company, Phoenixville, Pa.

Filed Jan. 27, 1982, Ser. No. 343,302
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—250 **9 Claims**

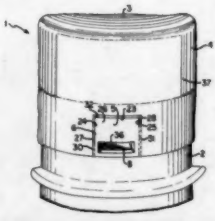
1. A venting closure for sealing a pressurized container comprising a stopper member having an elongated stem portion engageable in the discharge opening in the container, an enlarged head portion having a button chamber formed in its outer axial end face, a generally disc-like button rotatably mounted in said chamber having means defining a groove overlying a removable cap normally sealing a port in said stopper communicating with the interior head space of said container, vent channel means in said button, rotation of said button operable to displace the cap normally sealing said port to establish fluid communication therethrough and permit venting from the head space to the atmosphere through said vent channel means in said button.

4,401,227

TAMPER INDICATING CLOSURE CAP

Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207

Filed Aug. 17, 1981, Ser. No. 293,158
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **14 Claims**



1. A tamper indicating closure cap for use with a container having a mouth and a generally circumferential shoulder formed externally around a neck thereof and comprising:

(a) a top wall adapted to sealably engage the container mouth;

(b) a peripheral skirt depending from said top wall;

(c) surface means defining a slot in said skirt;

(d) a tamper tab positioned in said slot; said tab having edges and a projecting lug; said lug having an inwardly projecting position for substantially non-flexible engagement, during removal of said cap from the container, with the

shoulder formed externally around the neck of the container;

(e) connecting means integrally molded between said surface means of said slot and said edges of said tab, a portion of said tab being urged outward from said skirt and said connecting means thereby being ruptured upon said lug being biased against a lower surface of the shoulder during axial rotation of said cap for removal of said cap from the container such that said tab is at least partially separated from said cap along said connecting means to indicate that the container has been opened; and

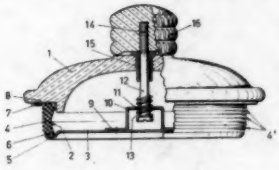
(f) said lug being partially resiliently flexible in such a manner that separation of said tab from said cap during initial placement of said cap on the container is prevented.

4,401,228

MECHANISM FOR RAPID AND HERMETIC CLOSING OF CERAMIC CONTAINERS

Massimo Baldelli, Citta' di Castello, Italy, assignor to Ceramiche di Riosecco dei Figli de Dante Baldelli & C. S.n.c., Citta' di Castello, Italy

Filed Apr. 5, 1982, Ser. No. 365,568
Claims priority, application Italy, Jan. 15, 1982, 47581 A/82
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—235 **10 Claims**



1. A closure mechanism for a ceramic container, comprising:

a ceramic cover having a circular raised edge part along its internal surface and a lower edge part depending therefrom, said lower edge having a diameter smaller than the outer diameter of said circular raised edge and smaller than an interior diameter of the side of said container;

a rubber ring having a first portion in mating contact with said circular raised edge, and a second portion connected with said first portion and abutting against said lower edge;

said first portion having an outer edge whose diameter is less than an outer diameter of said container but greater than said interior diameter of the side of said container and less than the diameter of an outer edge of said circular raised edge part, said first portion forming a support for said circular raised edge part;

said second portion including a peripheral stepped molding base;

a metal disc including a base having an outer edge with a peripheral grooved edge forming a seal with said peripheral stepped molding base; and

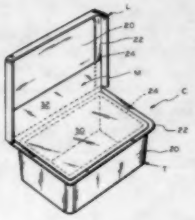
adjustment means connecting said metal disc and said ceramic cover for adjusting the position of said metal disc relative to said ceramic cover to vary the diameter of said rubber ring for expansion thereof to seal said ceramic cover to said ceramic container and to contract said rubber ring to facilitate removal of said ceramic cover from said ceramic container.

4,401,229

CARTON TRAY AND LID WITH MEMBRANE SEALING-HINGING ARRANGEMENT

Richard L. Bell, Exton, and Charles R. Helms, Malvern, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Mar. 25, 1982, Ser. No. 361,597
Int. Cl.³ B65D *43/16, 43/18, 51/18*
U.S. Cl. 220—259 **8 Claims**



1. In a sealing-hinging arrangement for a carton, the combination of:

(a) a body member including a rim presenting a sealing surface;

(b) a separate lid member including a rim presenting a sealing surface;

(c) a relatively thin, flexible, membrane formed of a sealable material and folded upon itself to present two sections separated from each other by a fold line;

(d) one of said sections being of sufficient size and shape to cover the entire sealing surface of the rim of one of said members, and the other of said sections being of sufficient size and shape to cover at least a portion of the sealing surface of the rim of the other member at one side of said other member;

(e) said sections being sealed to the rim sealing surfaces of the respective members to effect a hermetic seal therebetween;

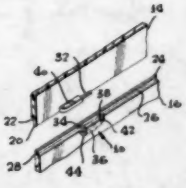
(f) said members being free from direct connection to each other, with said membrane functioning as the sole connection and hinge means between said members.

4,401,230

SNAP CLOSURE

John L. Hall, 2020 Lincoln Ave., Pasadena, Calif. 91103

Filed Jun. 7, 1982, Ser. No. 385,477
Int. Cl.³ B65D *43/14, 51/04*
U.S. Cl. 220—339 **10 Claims**



1. A snap closure for a housing having a top portion and a bottom portion;

one of said portions having a lip on the periphery thereof and a flange upstanding past said lip;

the other of said portions having an edge on a portion of the periphery thereof and a recess adjacent said edge so that when said portions are adjacent each other, said flange enters said recess so that said flange and said edge overlap;

a wall integrally formed adjacent said lip and standing upward spaced from and adjacent said flange to define a channel between said flange and said wall, said edge extending into said channel between said wall and said flange; and

a latch on said wall and a catch on said edge so that said catch and said latch interengage when said portions are engaged with each other, said latch being formed of resilient material so that said latch is deflected away from said flange when said catch enters and leaves said channel.

4,401,231

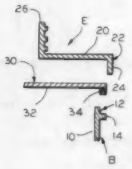
CONTAINER CLOSURE SEALING MEMBER AND METHOD OF FORMING

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed May 28, 1982, Ser. No. 383,021

Int. Cl.³ B65D *41/00*

U.S. Cl. 220—359 **8 Claims**



1. A pre-formed sealing member adapted for insertion between related rim areas of container body and closure members to provide sealing engagement therebetween, said sealing member comprising:

(a) a relative thin flat membrane element;

(b) an annular rim element formed integrally with a peripheral portion of said membrane element by insert injection molding;

(c) said rim element composed of a resinous sealing compound material compatible with the material of the material of the rim areas of the container body and closure members to which it is adapted to be attached and containing metallic particles which, when subjected to electrical current, will cause said material to heat and soften.

4,401,232

INTEGRALLY FORMED INJECTION MOULDED PLASTICS CONTAINER

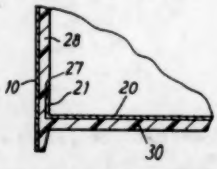
Michael J. Constable, Pucklechurch, and David S. Hamblin, Portishead, both of England, assignors to DRG (UK) Limited, Bristol, England

Filed Nov. 3, 1980, Ser. No. 203,370

Claims priority, application United Kingdom, Nov. 9, 1979, 7938931

Int. Cl.³ B65D *1/40, 25/14*

U.S. Cl. 220—450 **7 Claims**



1. An integrally formed injection moulded plastics container having a self-supporting tubular body closed by a self-supporting end closure at one end, the tubular body having a sleeve of sheet material outwardly of the injection moulded plastics, said sleeve being substantially coextensive with the outer surface of said tubular body and being secured thereto during the moulding operation, said sleeve of sheet material not extending over the outer surface of the end closure whereby the outer surface of the end closure comprises the plastics material, and the end closure having a layer of sheet material inwardly of the injection moulded plastics and secured thereto during the moulding operation, said layer of sheet material being substantially coextensive with said end closure and extending over the tubular body at most in a marginal portion turned axially whereby the inner surface of the tubular body comprises the plastics material and any marginal portion of said layer of sheet material, said injection moulded plastics material forming the tubular body and the end closure being formed in one piece, the peripheral edge of said layer of end closure sheet material being embedded in said injected moulded plastics material, and said injection moulded plastics material forming said tubular body and said end closure being thicker in cross section than the sheet material forming said sleeve and said layer.

4,401,233

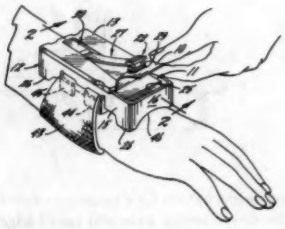
DISPENSER FOR SHEETS OF PAPER AND THE LIKE

Joseph V. Frey, 1111 S. Alpine Rd., Rockford, Ill. 61108

Filed Mar. 20, 1981, Ser. No. 245,662

Int. Cl.³ B65H *3/20*

U.S. Cl. 221—36 **3 Claims**



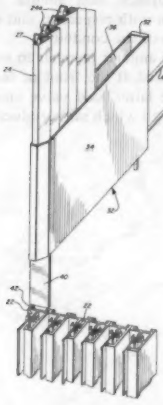
1. A dispenser for sheets of paper and the like comprising, a rectangular receptacle having top, bottom, side and end walls and adapted to receive a stack of said sheets, said top wall stopping short of the front end of said receptacle to provide an opening exposing a portion of the top sheet of said stack, an elongated slot centrally formed in said top wall and extending rearwardly from said opening to a point adjacent the rear end of said receptacle, at least one transverse abutment extending across said slot adjacent the rear end thereof, an elongated lever formed as a single piece of resilient plastic and disposed in said slot, the rear end portion of said lever being formed by vertically spaced legs straddling said abutment, a finger formed on one of said legs and engaging said abutment thereby mounting said lever on said top wall, the forward portion of said lever normally extending upwardly to position the forward free end of the lever above said top wall and over said opening, said free end including a downwardly projecting portion, and a pad of adhesive material mounted on the underside of said downwardly projecting portion to adhere to the top sheet of said stack when said free end of said lever is pushed down through said opening, said pad being operable when said free end is released and the forward end of said lever returns to its normal position to lift the end portion of said top sheet through said opening where it may be grasped and removed from said receptacle.

4,401,234

APPARATUS FOR APPLYING INTEGRATED CIRCUITS TO A CIRCUIT BOARD

Diego I. Droira, Chicago, Ill., and Richard J. Sikorski, Aurora, Colo., assignors to Universal Research Laboratories, Incorporated, Elk Grove Village, Ill.

Filed Jun. 1, 1981, Ser. No. 269,424
Int. Cl.³ H05K 3/30
U.S. Cl. 221—92 5 Claims



1. An automated apparatus for applying integrated circuits to a circuit board in which integrated circuits and the like are fed to the apparatus through the open end of a tubular magazine which holds said integrated circuits in a linear array positioned in registry with a feeding aperture of said apparatus, the improvement comprising, in combination:

casing means for holding a plurality of said tubular magazines in side-by-side relation, with a first of the magazines of said plurality occupying a position of registry with said feeding aperture, and meanns for biasing said magazines toward the position of said first magazine, whereby when the first magazine is emptied of integrated circuits, it may be removed from the casing means and another of said tubular magazines moved into the position of registry;

said casing means comprises a flattened, substantially tubular member proportioned to receive within the bore thereof said plurality of tubular magazines, one end of said tubular member carrying an end wall, a port in said one end proportioned to allow passage of integrated circuits from the first magazine to the feeding aperture, and attachment means to permit removable positioning of said casing means to place the first magazine into registry with the feeding aperture;

said attachment means comprising a bayonet member carried by and extending from said casing means for removable positioning adjacent said feeding aperture.

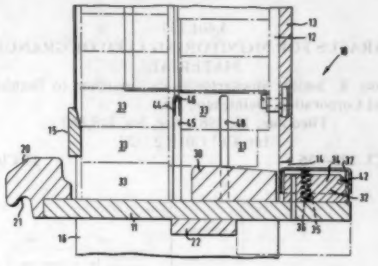
4,401,235

RECIPROCATING DRAWER TYPE PACKAGE VENDING MACHINE FOR DISPENSING VERTICAL BANKS OF PACKAGES

Herman B. Ratzker, 7 Jackson La., London N.6, England

Filed Apr. 10, 1981, Ser. No. 252,867
Claims priority, application United Kingdom, Apr. 14, 1980, 8012239
Int. Cl.³ B65G 59/06
U.S. Cl. 221—107 9 Claims

1. A vending machine comprising a casing with rear and side walls defining at least one vertical column of a depth capable of accommodating two juxtaposed banks of standard-sized packages of the goods to be dispensed, and a drawer defining the bottom of said column and reciprocatable between a closed and locked position and an open, dispensing position, the improvement comprising a step fixedly secured to the drawer, the said step being of a height less than the height of a standard-sized package, the length of this step (i.e. its dimension along the direction of the reciprocating movement of the drawer) being at most equal to the depth of the casing measured in that same direction and which in the closed position of the drawer projects rearwardly beyond the rear wall of the casing through an opening therein, and dividing means fixedly secured to the casing for dividing the interior space of the or each said column into two, the lower end of said dividing means being at a height above the top plane of the step by an amount more than the height of a said standard-sized package but less than twice the said height, wherein the said step comprises two juxtaposed physically discrete blocks, of which the front block, taken in the direction of drawer movement, has a top surface parallel with the plane of said movement, while at least one rolling element is mounted in a freely rotatable manner in the rear block about an axis normal to said movement, said element(s) projecting above the top surface of the rear block.

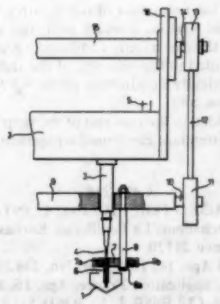


4,401,236

APPLIANCE FOR PICKING UP VERY SMALL ELEMENTS ONE BY ONE

Michel Germaine, 3 Sente des Bucherons, 76350 Oissel, France

Filed Mar. 16, 1981, Ser. No. 244,236
Claims priority, application France, Mar. 19, 1980, 80 06168
Int. Cl.³ B65H 3/08
U.S. Cl. 221—211 18 Claims



1. An apparatus for sequentially removing, one at a time, small sized elements from a receptacle containing a plurality of said elements, and for sequentially transfering said elements, one at a time, to a reception position, comprising a hollow needle having near its free end an opening with a cross-section smaller than the smallest dimension of the elements to be removed; mounting and transferring means for lowering said

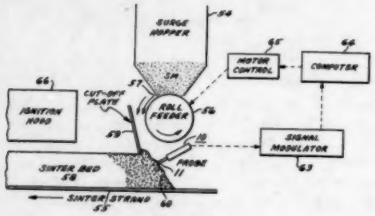
needle into said receptacle and for withdrawing said needle from said receptacle and for sequentially transferring said elements, one at a time, to the reception position; means for applying a vacuum in the needle when it enters the receptacle and during the transfer of the needle to the reception position and for suppressing the vacuum in the needle at the reception position; a tube slidably mounted on the needle; and means for imparting to said tube a linear oscillating motion along the needle axis to detach from the needle any elements held near the needle opening due to the vacuum effect, except for one element only which occupies the center position with respect to the needle opening.

4,401,237

APPARATUS FOR MONITORING FEED OF GRANULAR MATERIAL

Anthony R. Smith, Stockertown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 15, 1981, Ser. No. 225,560
Int. Cl.³ G01F *23/24*
U.S. Cl. 222—56 **11 Claims**



1. Apparatus used in combination with electronic equipment to monitor the depth of electrically conductive granular material in a container and on a carrier and to control the feed of the electrically conductive granular material into the container and onto the carrier, the apparatus comprising:

(a) an electrically conductive probe tip including a metallic strip having a forward end and a rear end, a metallic grid fastened on one surface at the forward end thereof, the metallic strip and metallic grid being enclosed in a sheath of electrically insulating material, a section of the sheath having a known surface area and thickness contiguous with the metallic grid containing particulate electrically conductive material, the section being characterized by an electrical resistivity which is lower than the electrical resistivity of the remainder of the sheath and an electrical resistance that various directly with the surface area in contact with the electrically conductive granular material,

(b) means provided in the rear end of the sheath for mounting the electrically conductive probe tip to complementary apparatus, and

(c) means provided in the rear end of the strip for connecting the strip to attendant electronic equipment.

4,401,238

DEVICES USED FOR FILLING CONTAINERS

Jean-Charles Marchadour, La Feuillerale Kerbascol, Saint Jean Trolimon, France 29120

Filed Apr. 14, 1981, Ser. No. 254,047
Claims priority, application France, Apr. 16, 1980, 80 08534
Int. Cl.³ B65B *3/10*; B26D *5/14*
U.S. Cl. 222—80 **10 Claims**

1. An apparatus for filling a container with a pasty product which may contain large inclusions, said apparatus comprising:

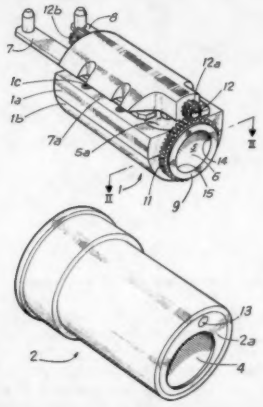
an endpiece having a cross-section which complements a cross-section of the container, said endpiece having an external plane frontal surface having an opening through which said product may pass;

first means within said endpiece defining an outlet conduit positioned to the rear of said frontal surface and adapted to receive a predetermined quantity of said product which is propelled into said outlet conduit at the rear thereof, said outlet conduit having an open front end from which said product may enter said container;

an annular member aligned with the opening in said frontal surface and having an opening through which product in said conduit may pass, said annular member having an external face disposed in a common plane with said frontal surface of said endpiece; said annular member being mounted for rotation with respect to said endpiece about the longitudinal axis of the conduit;

means for causing said annular member to rotate;

a valve member disposed at the front of said conduit and adapted to close the latter, said valve member provided with a passage through which said product may pass; said



valve member adapted to pivot relative to said first means; said valve member having an external surface which cooperates with an inner surface of said annular member, said inner surface forming a bearing surface for said valve member;

said valve member having a cutting edge defined by at least part of a line of intersection between said passage and said external surface of said valve member, said cutting edge cooperating with an edge of said annular member defined by a line of intersection between said external face of said annular member and said inner surface of said annular member; and

means for controlling pivoting of said valve member about said axis between a first position in which said conduit is open and a second position in which said conduit is closed by said valve member, with said valve member being pivotable while said annular member is rotating.

4,401,239

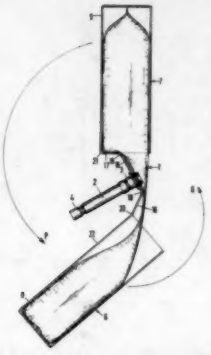
TRANSPORT AND DISPENSING CONTAINER FOR LIQUID MATERIAL

Johan H. C. Thomassen, Zeist, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Jun. 5, 1981, Ser. No. 270,812
Claims priority, application Netherlands, Jun. 6, 1980, 8003325
Int. Cl.³ B65D *5/60*
U.S. Cl. 222—183 **6 Claims**

6. A container for transporting and dispensing liquids comprising an elongated flexible plastics bag having a central portion fitted with a discharge spout projecting from said central portion; a box of more rigid construction than said bag

for supporting and enveloping said bag, said box having two tubular portions such enclosing about one half of the bag and said box having a folding wall through which said discharge spout projects, said folding wall interconnecting said two tubular portions such that said tubular portions can swing



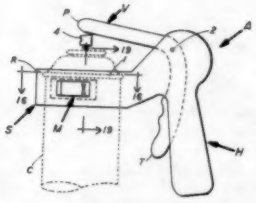
approximately 180° between a transport position in which said tubular portions are generally parallel and in which said bag is folded in a U-shaped with said spout enclosed between said bag halves and a dispensing position in which said tubular portions are generally parallel and in which said bag is folded in a U-shape with said spout projecting outwardly from the box.

4,401,240

HAND HELD SPRAY CAN ADAPTER

Joe B. Brack, P.O. Box 1119, 1314 Market St., Baytown, Tex. 77520

Filed Feb. 23, 1981, Ser. No. 236,769
Int. Cl.³ B05B *11/00*
U.S. Cl. 222—323 **10 Claims**



1. A holder for a pressurized fluid cannister of the type having a discharge valve at the upper end of the cannister, and an external raised bead at the upper end of the cannister, comprising:

a handle member;

a cannister support member secured to said handle member and adapted to receive the cannister;

said cannister support member comprising a continuous ring adapted to surround the perimeter of the cannister, said ring having a lateral surface to provide a restricted opening of a smaller size than the size of the external bead on the cannister;

said ring being open for its full extent below said restricted opening and being at least as large as the size of the bead to permit the cannister to be received in said ring for engagement with said lateral surface of said restricted opening;

said support member having clamp means for removably mounting the cannister to said support member comprising an eccentric cam, pivotally mounted to said cannister support member, adapted to selectively engage the raised bead of the cannister; and

valve actuating means operably connected to said handle member for actuating the discharge valve.

10. A holder for a pressurized fluid cannister of the type having a discharge valve at the upper end of the cannister, and an external raised bead at the upper end of the cannister, comprising:

a handle member;

a cannister support member secured to said handle member and adapted to receive the cannister;

said cannister support member comprising a continuous ring adapted to surround the perimeter of the cannister, said ring having a lateral surface to provide a restricted opening of a smaller size than the size of the external bead on the cannister;

said ring being open for its full extent below said restricted opening and being at least as large as the size of the bead to permit the cannister to be received in said ring for engagement with said lateral surface of said restricted opening;

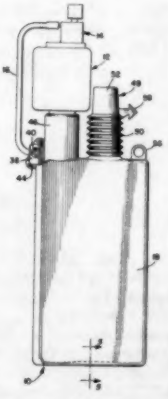
said support member having clamp means for removably mounting the cannister to said support member comprising an arcuate wedge member, slidably mounted to said support member, and adapted to selectively engage the raised bead of the cannister.

4,401,241

NEBULIZER BOTTLE

Exequiel D. Cruz, Palatine, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed Jan. 19, 1981, Ser. No. 226,087
Int. Cl.³ B67D *5/06*
U.S. Cl. 222—527 **10 Claims**

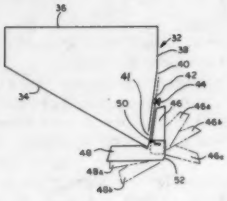


1. In combination with a container having an end wall from which at least one tubular flow section extends in one direction and is bent to an operative position directing flow transversely of said one direction, the improvement residing in means for holding the tubular flow section in said operative position, comprising a retainer formation projecting from the end wall, and latch means projecting from the tubular flow section for reception through the retainer formation in the operative position of the tubular flow section.

4,401,242
DUAL DELIVERY HOPPER DISCHARGE APPARATUS

Melvin E. Bonomo, 109 S. Regency, Bloomington, Ill. 61701

Filed Apr. 20, 1981, Ser. No. 255,642
Int. Cl.³ B65G 67/06
U.S. Cl. 222—533 14 Claims



1. A hopper discharge apparatus for delivering the contents of a hopper from a hopper side port toward alternative delivery points below the hopper, comprising:

a center delivery chute having upstanding sidewalls along each of its edges for directing the contents of the hopper toward a delivery point directly under the hopper;

a side delivery chute having upstanding walls along each of its edges for directing the contents of the hopper from the side port alternatively to a delivery point alongside the hopper or to said center delivery means;

said center delivery chute being movable between a closed position and a center delivery position directed toward said delivery point directly under the hopper;

said side delivery chute being movable between an upstanding back-up position and a side delivery position directed toward said delivery point alongside the hopper; and

said chutes being mounted for movement between their respective positions about a common pivot,

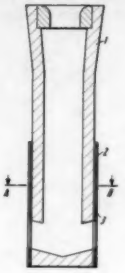
whereby said hopper discharge apparatus may be placed alternatively in a side delivery mode with said center delivery chute in its closed position and said delivery chute in its side delivery position, and in a center delivery mode with said center delivery chute in its center delivery position and said delivery chute in its upstanding back-up position.

4,401,243
CHARGING A MOLD FOR CONTINUOUS CASTING

Gerd Diederich, Düsseldorf; Rolf Solmecke, Meerbusch; Hans Hüsselmann, Krefeld; Eberhard Heimann, Bad Hönningen, and Frithjof Schäuffele, Leutesdorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,384
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646707
Int. Cl.³ B22D 11/10
U.S. Cl. 222—591 3 Claims

1. An immersion-type feeder pipe for charging a mold with steel for continuous casting, which pipe is made of a fireproof material, the improvement comprising an outer porous cover disposed over at least part of the pipe and made of a heat-insulating, fibrous fleece- or mat-like construction, the fibers being made of at least one refractory oxide selected from the group, comprising alumina, silica, zirconium oxide, and chromium oxide; and

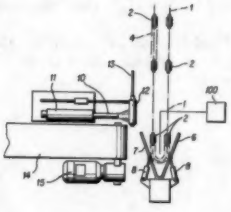


said cover being bonded to the pipe by means of a refractory bonding agent.

4,401,244
AUTOMATIC APPARATUS FOR SUPERIMPOSING, FOLDING AND TRANSFERRING PAIRS OF STOCKINGS TO A COLLECTION STATION

Fabio Selvi, and Giovanni Chietti, both of Florence, Italy, assignors to C.K.S. S.n.c., Florence, Italy

Filed Aug. 18, 1980, Ser. No. 178,718
Claims priority, application Italy, Sep. 4, 1979, 25476 A/79
Int. Cl.³ D06C 15/00
U.S. Cl. 223—37 5 Claims



1. An apparatus for pairing, folding and transferring to a collection station pairs of stockings or socks, said apparatus comprising:

a movable elongated conveyor means, said conveyor means defining a turn;

a plurality of gripper means mounted on said conveyor means;

a pair of movable walls, one of said walls being positioned on either side of said conveyor means at said turn, each of said walls including a slot;

first means for moving said walls towards and away from one another;

a movable arm located at one side of said conveyor means, said arm having a distal end movable between a first position and a second position which traverses the path of said conveyor means;

second means for moving said movable arm;

pick up means carried by said distal end of said arm, said pick up means including a pick up element movable between a retracted position and an extended position in which said pick up element is able to pass through said slots of said walls as said arm moves between said first and second positions;

third means for moving said pick up element; and

means for opening and closing said gripper means;

whereby stockings held by said gripper means are paired by

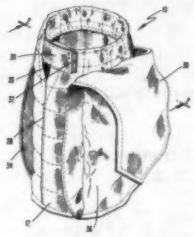
said walls moving towards one another, and whereby the movement of said arm from said second position to said first position, while said pick up element is extended, draws said stockings through one of said slots so as to fold said stockings and transfer said paired and folded stockings to said collection station.

4,401,245

COLLAPSIBLE, INSULATIVE BEVERAGE CONTAINER CARRIER

Robert V. Zills, Winter Haven, Fla., assignor to Crymes Enterprises, Inc., Tucker, Ga.

Filed Jul. 21, 1981, Ser. No. 285,631
Int. Cl.³ B65D *23/08*
U.S. Cl. 224—148 **7 Claims**



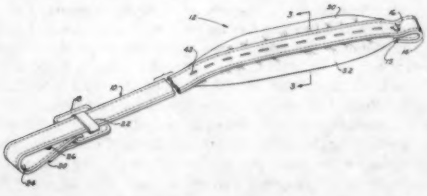
1. An insulated, collapsible carrier for a beverage container, said carrier comprising an insulated jacket having an open upper end for receiving said container, said jacket completely surrounding a sidewall of said container, a longitudinal slit formed in said jacket at the upper end thereof, a closure band positioned at and parallel to the upper end of said jacket, said band extending across said slit and different portions of said band being releasably securable to said jacket to provide a variable diameter opening for receiving various beverage containers; a longitudinal gripping strap extending along substantially the entire height of said jacket and adapted to wrap around a user's hand; a pocket secured on said jacket; a cover flap extending downwardly from an upper end of said pocket; and means for releasably securing said cover flap to said pocket.

4,401,246

ADJUSTABLE CARRYING STRAP

Jane H. Dickinson, and Leebert D. Clark, both of Yoakum, Tex., assignors to Torel, Inc., Yoakum, Tex.

Filed Jan. 19, 1981, Ser. No. 226,028
Int. Cl.³ F41D *11/00*
U.S. Cl. 224—150 **4 Claims**



1. A process for attaching a longitudinal shoulder pad to a main strap of a gun sling, which comprises:

separating into an upper piece and a lower piece, one end portion of a main strap element along its longitudinal plane;

lacing the longitudinal central portion of the pad to the lower piece of the main carrying strap;

overlaying the upper piece of the main strap onto the lower piece of the main strap; and

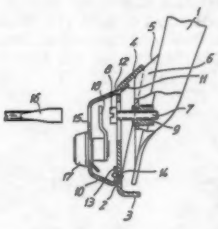
passing a plurality of stitches through the upper piece, the lower piece and the longitudinal central portion of the pad so that the pad is firmly connected to the main strap.

4,401,247

FASTENING DEVICE FOR SUPPORTING BRACKETS OR LUGGAGE RACKS FOR AUTOMOTIVE VEHICLES

Reinhold Zoor, Dachau, Fed. Rep. of Germany, assignor to Heinrich Wunder GmbH Co. KG, Dachau, Fed. Rep. of Germany

PCT No. PCT/DE80/00092, § 371 Date Feb. 25, 1981, § 102(e) Date Feb. 25, 1981, PCT Pub. No. WO81/00087, PCT Pub. Date Jan. 22, 1981
PCT Filed Jun. 27, 1980, Ser. No. 243,930
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925994
Int. Cl.³ B60R *9/04*
U.S. Cl. 224—315 **6 Claims**



1. In a luggage rack or an analogous carrier of objects on the roof of an automotive vehicle of the type having a roof gutter, the combination of at least one supporting member which can extend from above into the roof gutter of a vehicle; a claw which can overlie such roof gutter and engage the latter from below a device for releasably securing said claw to said supporting member and to the roof gutter of the vehicle on which the carrier is mounted; a protecting cap mounted on and located in front of said claw and having an aperture which renders the securing device accessible through said cap, said protecting cap being nonseparable from the claw from the outside thereof; and a blocking device provided on said cap and having a portion movable between first and second positions in which said portion respectively presents and affords access to said supporting member in said aperture.

4,401,248

COMPOSITE MOLDED PLASTIC AND PAPERBOARD DISPENSING DEVICE

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jun. 1, 1981, Ser. No. 269,418
Int. Cl.³ B65D *85/672*
U.S. Cl. 225—47 **7 Claims**

1. In a composite molded plastic and paperboard dispensing device formed by an insert molding process, the combination of:

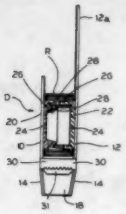
(a) a housing formed from a unitary blank of foldable paperboard and including:

(i) a bottom wall;

(ii) a pair of end walls foldably joined to and upstanding from opposite end edges of said bottom wall;

(b) a pair of integral, molded plastic, cylindrical supporting members bonded to opposing surfaces of said end walls by the insert injection molding process and adapted for cooperation with each other to support a roll containing material to be disposed from said roll;

(c) an integral, molded plastic cutting member bonded to said housing by the insert injection molding process and



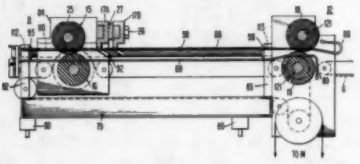
extending between said end walls for cutting material from the roll mounted on said supporting members.

4,401,249

AUTOMATIC BURSTER APPARATUS HAVING A DOUBLE BURSTING BAR

Jack Kadlecik, Macedon, and Alvin M. Hill, Rochester, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 29, 1981, Ser. No. 335,421
Int. Cl.³ B65H *35/10*
U.S. Cl. 225—97 **11 Claims**



1. Bursting apparatus for continuous forms comprising:
first feeder means for advancing said continuous forms from a supply tray;
second feeder means for receiving said continuous forms from said first feeder means and advancing the burst forms to a stacking device;
tensioning means for tensioning said forms between said first and second feeder means;
releasing means for intermittently releasing the feeding action of said first feeder means such that crinkles in said continuous forms may be removed;
first separating means disposed at a point between said first and second feeder means for cooperating with preweakened zones in said continuous forms to burst said forms when no uncrinkling of said continuous forms has occurred immediately prior to said bursting; and,
second separating means disposed at a point between said first and second feeder means for cooperating with preweakened zones in said continuous forms to burst said forms when uncrinkling of said continuous forms has occurred immediately prior to said bursting.

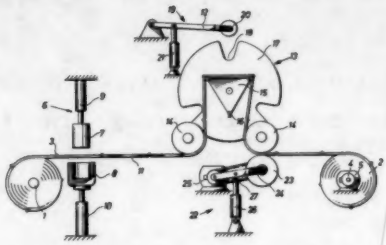
4,401,250

METHOD AND AN ARRANGEMENT FOR THE FORWARD FEEDING OF A MATERIAL WEB IN REGISTER WITH A CREASE LINE PATTERN

Lars Carlsson, Blentarp, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Feb. 3, 1982, Ser. No. 345,373
Claims priority, application Sweden, Feb. 25, 1981, 8101229
Int. Cl.³ B65H *23/18, 17/22*
U.S. Cl. 226—33 **12 Claims**

1. A method for selectively advancing a material web, comprising:
feeding the web forward by driving means over a distance which exceeds a desired length of forward feed by a predetermined length;
contacting one of a plurality of transverse weakening lines of the web with register holding means; and



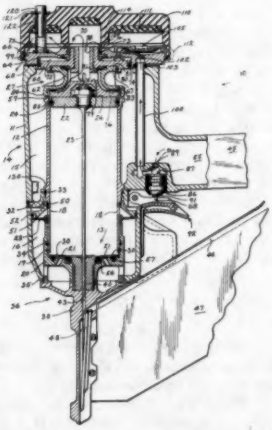
repositioning a portion of the web located between said driving means and said register holding means, said repositioning being used to locate said one weakening line at a desired distance from said driving means.

4,401,251

BUMPERLESS GUN NAILER

Milovan Nikolich, Skokie, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Nov. 19, 1980, Ser. No. 208,215
Int. Cl.³ B25C *1/04*
U.S. Cl. 227—130 **21 Claims**



21. A pneumatic fastener applying tool, comprising: a housing adapted to contain a supply of air under pressure; a main cylinder in said housing having open and closed ends; a main piston slidably disposed in said main cylinder and having a fastener driver secured to one side thereof which extends out through the closed end of said main cylinder; means for feeding a fastener into position to be driven by said driver; valve means, cooperating with the open end of said main cylinder, for controlling the flow of air into and out of said main cylinder to move the main piston through its driving and return stroke; a sealed chamber defined by said tool adjacent the closed end of said main cylinder; valve means, disposed above the closed end of the main cylinder for controlling the flow of high-pressure air into said sealed chamber, and valve means, adjacent the closed end of the main cylinder for admitting air into the main cylinder below said main piston whereby air will be trapped in the main cylinder below the main piston which will be compressed by the main piston to form a cushion preventing contact between the main piston and the bottom of the

main cylinder and air will be introduced into the closed end of the main cylinder from the sealed chamber when the air above the main piston has been exhausted to return the main piston into its driving position.

4,401,252

METHOD OF CONNECTING ARMATURE COIL

Isao Hamano, and Kiyoshi Yabunaka, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

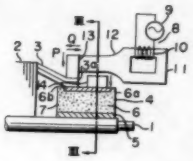
PCT No. PCT/JP80/00091, § 371 Date Nov. 5, 1980, § 102(e) Date Nov. 5, 1980, PCT Pub. No. WO80/02481, PCT Pub. Date Nov. 13, 1980

PCT Filed Apr. 30, 1980, Ser. No. 212,721

Claims priority, application Japan, May 7, 1979, 54-56755

Int. Cl.³ B23K *20/10*; H01R *43/02*

U.S. Cl. 228—110 **2 Claims**



1. A method of unitarily connecting an end portion of an armature coil to a one-piece, molded substrate type commutator segment fitted around a motor shaft wherein said commutator segment is arranged in the direction of the axis of said shaft, which comprises:

peripherally contacting said commutator segment with a pressing member;

applying a radially inwardly directed pressing force to said commutator segment; and

ultrasonically welding said end portion of said armature coil to said commutator segment.

4,401,253

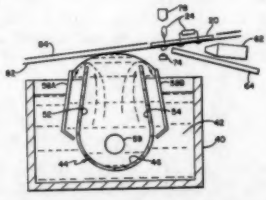
MASS SOLDERING SYSTEM

Harold T. O'Rourke, Milford, N.H., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 897,492, Apr. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 856,759, Dec. 2, 1977, abandoned. This application Oct. 12, 1977, Ser. No. 951,052

Int. Cl.³ H05K *3/34*

U.S. Cl. 228—125 **27 Claims**



1. A method of mass joining with solder printed circuit boards having mounted thereon components with leads protruding downward through holes in said board, said method comprising the steps of:

depositing a quantity of molten solder onto the underside of said board and said downward protruding leads, and, substantially immediately following said depositing impinging a stream of gas containing liquid droplets dispersed therein onto the underside of said board and said protruding leads whereby to relocate or remove a portion of the molten solder deposited on said board and said protruding leads before said molten solder solidifies thereon.

4,401,254

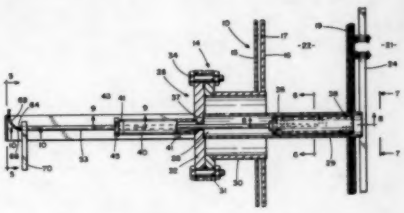
VACUUM BRAZING PROCESS WITH IMPROVED GETTERING

Vernon N. Tramontini, Indianapolis, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Sep. 29, 1980, Ser. No. 191,526

Int. Cl.³ B23K *1/04*; F27B *5/04*

U.S. Cl. 228—217 **14 Claims**



1. In the vacuum brazing of large metal assemblies having numerous joints to be brazed both at the surface of the assembly and interiorly of the assembly, in an enclosed furnace the operative steps of; placing the assembly to be brazed in the furnace with a brazing material containing a gettering agent in the area of the joints to be brazed, elevating the temperature of the furnace toward the brazing temperature of the metals to be joined, vaporizing an additional quantity of a gettering agent in the furnace as the temperature of the surface of the assembly approaches the brazing temperature of the metals to be joined to supplement the gettering effect of the gettering agent in the area of the surface of the assembly at that time, and elevating the temperature of the furnace for a time to approach the brazing temperature of the joints interiorly of the assembly so that the gettering agent in the area of the interior joints getters the area adjacent those joints.

2. In the vacuum brazing of metal assemblies with plural joints to be formed in an enclosed furnace having a hot zone and a relatively cool zone, the operative steps of placing the assembly in the hot zone of the furnace in the presence of a brazing material in the area of the joints to be brazed with a gettering agent adjacent the joints to be formed, placing a supplemental gettering agent in the cool zone of the furnace, elevating the furnace temperature toward the brazing temperature of the metals to be joined, moving the supplemental gettering agent from the cool zone to the hot zone to vaporize a portion of the gettering agent to getter the furnace volume, and withdrawing the supplemental gettering agent from the hot zone to the cool zone after wetting and flow of the braze material at least at one of the joints but prior to wetting and flow of all the joints to control the amount of gettering agent vaporized.

4,401,255

DISTRIBUTOR PACK CARTON

Betty A. Conroy, Ridgefield, N.J.; William M. Brown, Darien, Conn., and Patrick S. Maio, Ridgewood, N.J., assignors to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Aug. 3, 1981, Ser. No. 289,728

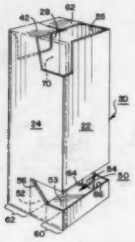
Int. Cl.³ B65D *5/72*

U.S. Cl. 229—37 R **16 Claims**

1. A folding carton made from a pre-glued tube of paperboard or the like and adapted to receive therein a plurality of individually packaged articles, said carton including, in its erected condition and in a position of normal use, a pre-glued

paperboard tube having four joined vertical walls including a front wall and a pair of opposed sidewalls, and a rear wall, cover means for forming a top closure for said carton, including

top cover-forming flaps associated with said sidewalls of a reduced width in relation to the width of said sidewalls, and having one pair of flap edges thereof which lie parallel to and closely adjacent one of said carton walls and another pair of flap edges lying parallel to but spaced from an oppositely disposed carton sidewall to provide an opening for viewing the contents of said carton,



said carton having a bottom closure in the form of a closure strap formed from a first wall of said pre-glued tube, and extending between opposed vertical walls of said tube, said bottom closure strap being positioned and supported by depending strap hangers attached to said closure strap, each strap hanger being formed from a vertical wall of said pre-glued tube other than said first wall and being joined to said wall at the upper end of said strap hanger along a fold line, said fold line permitting said strap and hangers to be folded out of the respective planes of said pre-glued tube formed by said joined vertical walls to provide support for articles within said tube and a contents-viewing opening in three sides of said tube.

4,401,256

LAMINAR THERMOPLASTIC FILMS, BAGS THEREOF

Donald J. Krieg, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,478

Int. Cl.³ B65D *30/00*

U.S. Cl. 229—53 **26 Claims**

1. A heat sealable film laminate comprising a first layer comprising a major amount of a high density polyolefin, a minor amount of an adhesion promoting ionomer and a heat seal promoting proportion of a metal salt of a fatty acid; and a second layer adhering to said first layer, said second layer comprising a polyamide.

14. A laminar thermoplastic bag, particularly suited for the containment of foodstuffs to be heated to a preparation temperature, which comprises a first layer comprising a major amount of a high density polyolefin, a minor amount of an adhesion promoting ionomer and a heat seal promoting proportion of a metal salt of a fatty acid; a second layer adhering to said first layer and comprising a polyamide; and wherein said bag includes a heat seal between contacted faces of said first layer along at least one edge region of said bag.

4,401,257

MULTIPLE POCKET, EXPANDABLE ENVELOPE, AND BLANK AND METHOD FOR FORMING SAME

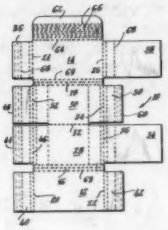
Albert A. Benham, Granville, Mass., assignor to Champion International Corp., Stamford, Conn.

Filed Sep. 18, 1980, Ser. No. 188,591

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ B65D *27/08*

U.S. Cl. 229—72 **5 Claims**



1. A multiple pocket, expandable envelope formed from a planar, unitary blank, comprising:

a front, a back, and a first and a second intermediate panel between said front and back panels, each of said panels having opposed end edges and opposed side edges, said intermediate panels being hingedly coupled along a common end edge thereof while said first intermediate panel is hingedly coupled to said front panel along a common end edge and said second intermediate panel is hingedly coupled to said back panel along a common end edge,

front and back divider panels each having opposed side edges, said front divider panel being hingedly coupled at one side edge thereof to one of said first intermediate and front panels, and said back divider panel being hingedly coupled at one side edge thereof to one of said second intermediate and back panels;

first means hingedly coupling said one side edge of said front divider panel to the other of said first intermediate panel and said front panel;

second means hingedly coupling the other side edge of said front divider panel to said front panel;

third means hingedly coupling the other side edge of said front divider panel to said first intermediate panel;

fourth means hingedly coupling said one side edge of said back divider panel to the other of said second intermediate panel and said back panel;

fifth means hingedly coupling the other side edge of said back divider panel to said second intermediate panel; and

sixth means hingedly coupling the other side edge of said back divider panel to said back panel.

4,401,258

LETTER CARD AND CONFINING MEANS THEREFOR

Ingrid Büchler, Merzig, Fed. Rep. of Germany, assignor to Villeroy & Boch Keramische Werke KG, Mettlach, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 308,090

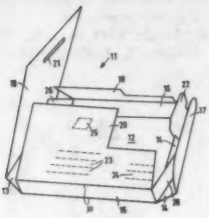
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105728

Int. Cl.³ B65D *85/30*; B42D *15/02*

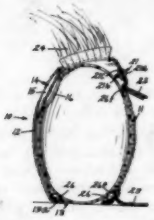
U.S. Cl. 229—92.8 **26 Claims**

1. A letter, comprising a durable letter card including at least one relatively thin plate consisting of a ceramic material and bearing permanently applied decorative material in the form of one or more images and/or lettering, and means for displaying

said plate; and an at least substantially rigid and shock-absorbent envelope for at least substantial concealment and confinement of said letter card and for protecting the card against damage during mailing or other forms of shipment.



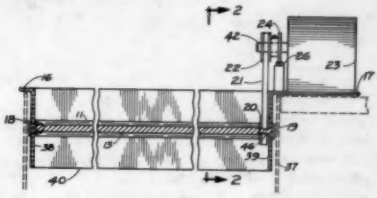
4,401,259
COIN BANK
Darryl C. Knutson, Medicine Lake, Minn., assignor to Toystalgia, Incorporated, Golden Valley, Minn.
Filed Dec. 11, 1980, Ser. No. 215,244
Int. Cl.³ A45C *1/12*; A63H *33/34*
U.S. Cl. 232—4 R **1 Claim**



1. A coin bank comprising:
a hollow, oval-shaped container having a solid shell;
an unreinforced fabric covering, said covering being adjacent to said container thereby taking on substantially the form of said container, said covering having an interior volume, said covering extending partially under said container so said container substantially fills the interior volume of said covering, said covering having an adjustable bottom opening permitting said container to be inserted into and removed from said covering;
means for depositing coins through said covering into said container, said depositing means including a second opening in said covering and a third opening in said container, said second and third openings being aligned; and
an elastic member about the periphery of said bottom opening, said elastic member for adjusting said bottom opening, for holding said covering in place on said container, and for holding said oval container in an upright position on a surface.

4,401,260
SELF-OPERATED AIR REGISTER DAMPER
Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228
Filed Dec. 9, 1981, Ser. No. 328,814
Int. Cl.³ F24D *5/02*
U.S. Cl. 236—9 A **10 Claims**

1. A self-operating damper device controlling and regulating the flow of a heating/cooling medium from a heating/cooling device into individual rooms or spaces, said heating/cooling device being part of a central air conditioning system, said damper device combinationally comprising:
(a) an enclosure providing housing means and support means for a closure means and transmission means, said enclosure comprising a damper housing having open top and bottom sections, end panels incorporating and having first and second support means, and motor covering means, said enclosure adapted for mounting on external means adjacent to said damper housing;
(b) said closure means providing open and closed conditions within said enclosure, said closure means being comprised of a damper blade having a damper shaft coincident with a longitudinal axis of said damper blade, compressible sealing means bonding to said damper blade, and plate sealing means attaching to one said end panel of said damper housing; said damper blade with bonded compressible sealing means comprising movable means of said closure means; said movable means being pivotally mounted in said damper housing and attaching to and rotatable by said transmission means;



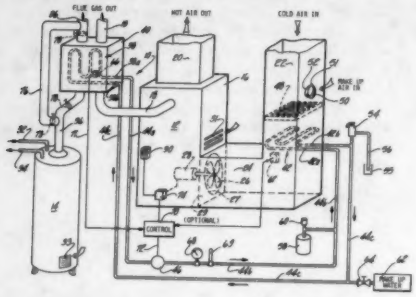
(c) said transmission means rotating said movable means pivotally mounted within said enclosure, said transmission means comprising motor means supported on said damper housing, said motor means having a rotatable motor shaft and a cam attaching to said motor shaft, a first and a second pulley having attachment to said motor shaft and said damper shaft respectively, and a continuous belt rotatably connecting said first and second pulleys;
(d) control means operating and controlling said transmission means, said control means comprising: thermostatic means electrically interlocking relay means to a fuel control means of said heating/cooling device, and said motor means to said relay means and said fuel control means through a two way switch; said relay means having a relay coil operating first and second contacts and a time delay device connecting to and being controlled by said second contacts, a manual switch having light means interconnecting said transmission means to said fuel control means and relay means through said two-way switch.

4,401,261
FLUE GAS HEAT RECOVERY APPARATUS
LeeRoy W. Brown, 30245 Barbary Ct., Warren, Mich. 48093
Filed Oct. 23, 1980, Ser. No. 199,908
Int. Cl.³ F23M *1/02*
U.S. Cl. 236—10 **9 Claims**

1. A flue gas heat recovery apparatus for use with a forced air type furnace including a blower, first blower control means for selective operation of said blower, an exhaust flue and a cold air return duct, said apparatus comprising:
a gas to liquid heat exchanger mounted in said flue and operative to absorb exhaust gas heat from within said flue;
a liquid to gas heat exchanger mounted in said cold air return duct in fluid communication with said gas to liquid heat exchanger and operative to expend said absorbed exhaust gas heat within said cold air return duct;
pump means interposed between said gas to liquid heat exhanger and liquid to gas heat exchanger operative to circulate a liquid between said heat exchangers in response to a control signal to effect a net heat transfer from the gas within said flue to the air within said cold air return duct; said heat

exchangers and pump means being connected in series for fluid communication in a closed loop;

second blower control means operative to monitor the temperature of said exhaust gas and generate said control signal as a function of said temperature and preselected temperature level limits, said second blower control means further comprising means for temporarily overriding the first blower



control means during generation of said control signal such that the blower of the forced air furnace operates continuously when said exhaust gas temperature exceeds one of said temperature level limits; and

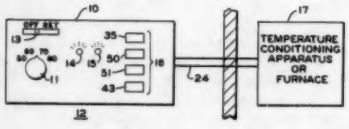
air relief and purge valve means mounted in said closed loop operative to remove any air which may inadvertently enter said closed loop.

4,401,262

ENERGY SAVING THERMOSTAT WITH MEANS TO SHIFT OFFSET TIME PROGRAM

John T. Adams, Minneapolis, and Marvin D. Nelson, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 18, 1982, Ser. No. 389,538
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—46 R **8 Claims**



1. A thermostat adapted to be connected to a remote temperature conditioning apparatus for controlling the temperature of air in a space to maintain a first temperature during a first period of time and a second temperature during a second period of time, comprising,

temperature responsive means responsive to a space temperature,

control circuit means adapted to be connected to the temperature conditioning apparatus,

means connecting said temperature responsive means to said control circuit means for establishing a control temperature to maintain the first temperature in the space,

single button manually settable electronic time interval means for providing a second period of time,

means connecting said time interval means to said control circuit means to change said control temperature to maintain a second temperature in the space for said second period of time at a predetermined starting time each day, and

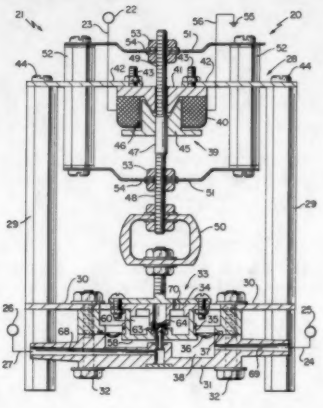
driving means connected to said settable electronic time interval means for changing said predetermined starting time of said second period of time.

4,401,263

PNEUMATIC RELAY CONTROLLED TRANSDUCER CONSTRUCTION

James A. Crowson, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 20, 1981, Ser. No. 265,599
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—84 **10 Claims**



1. In an electrical current input to a pneumatic signal output transducer construction wherein said signal is substantially proportional to said current and is generated by a pneumatic relay means of said construction that is controlled by an electrical current receiving means of said construction, the improvement wherein said current receiving means comprises a fixed electrical coil that is adapted to have said current flow therethrough and a movable armature disposed in said coil and being operatively interconnected to said relay means to control said relay means in relation to the position of said armature relative to said coil.

4,401,264

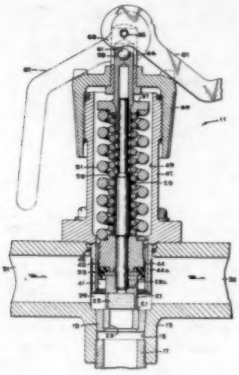
RELIEF VALVE

Michael R. Williams, and Dean McDonald, both of Jonesboro, Ark., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 679,534, Apr. 23, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,785
Int. Cl.³ B05B *9/00*
U.S. Cl. 239—126 **3 Claims**

1. An improved spray system of the type including a plurality of spray nozzles, a fluid flow line connected to said nozzles, means for supplying fluid to be sprayed under pressure to said flow line, and a relief valve assembly operatively associated with said flow line for bypassing fluid from said line when the pressure in said line exceeds a preselected magnitude, wherein the improvement comprises a relief valve assembly including: a valve housing having an inlet port which communicates with said fluid flow line and a bypass port for bypassing fluid from said fluid flow line; a valve seat having a bypass passageway extending therethrough which permits bypass flow from said inlet port to said bypass port; said housing including a member having a bore therein which is axially aligned with said bypass passageway and a spring chamber means aligned with said bore; plug means which is centered relative to the inlet of said bypass passageway and which is shiftable within said housing bore from said valve seat for permitting bypass flow through said bypass passageway, said plug means including means for forming a substantially fluid-tight sliding seal with said bore; spring means within said spring chamber means for biasing said plug means toward said seat; control surface means exposed to

the fluid pressure in the valve for creating a lifting force on the plug which shifts said plug means counter to the biasing force exerted by said spring means when the fluid pressure at said inlet port exceeds preselected magnitude, thereby permitting bypass flow through said bypass passageway to maintain the pressure in said flow line at a constant level, with said spring means exerting increasingly greater biasing force on said plug means as said plug means is shifted away from said seat, and means disposed circumferentially about the inlet to said bypass passageway for producing a stagnation pressure acting on said plug means which is additive to the lifting force and provided by the fluid flow pressure on the control surface means and which is thus opposed to said biasing force, said stagnation



pressure producing means including opposed, parallel, and flat annular surfaces on said plug means and seat for directing bypass flow radially inwardly to impinge upon itself directly below the center of the bottom surface of said plug means, with said stagnation pressure producing means producing greater stagnation pressure with increasing energy of the stagnating bypass flow into the contiguous bypass passageway to thereby counteract increasing biasing forces resulting from said plug means being shifted further away from said seat, whereby the pressure in said fluid flow line may be maintained substantially constant over a wide range of flow rates through the fluid flow line irrespective of the diameter of said bypass passageway in said seat.

4,401,265

METHOD AND DEVICES FOR MAKING TRAFFIC LINES OR THE LIKE

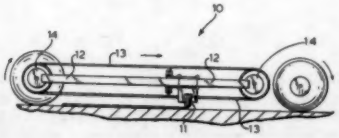
Frank Hofmann, Hamburg, Fed. Rep. of Germany, assignor to Firma Walter Hofmann, Rellingen, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 195,724

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941602

Int. Cl.³ E01F *9/08*; E01C *23/16*

U.S. Cl. 239—1 **1 Claim**



1. In a method for making marking strips and marking interruptions on a roadway so as to produce a traffic line composed of discrete, spaced-apart segments with a device comprising a marking machine and an activatable and deactivatable application means for applying marking material to the roadway displaceably mounted on the marking machine for movement between a forward and rearward position thereon, the improvement comprising the steps of:

moving said marking machine at a forward speed over the roadway in a driving direction;

alternately activating and deactivating said application means so as to produce a traffic line on said roadway composed of discrete, spaced-apart segments; and

displaceably moving said application means between said forward and rearward positions thereof such that said application means is moving in the forward direction relative to the ground, while moving rearward relative to said marking machine, so as to spray said marking strip onto the ground during activation thereof.

4,401,266

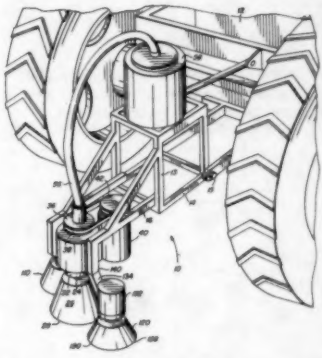
METHOD FOR THE DISTRIBUTION OF BIOLOGICALLY ACTIVE CHEMICALS

William A. Funkhouser, Buckeye, Ariz., assignor to Albany International Corporation, Albany, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,448

Int. Cl.³ B05B *17/04*

U.S. Cl. 239—7 **5 Claims**



1. A method for distributing biologically active chemicals of the low-volume type encapsulated in dispenser, said method comprising:

(a) applying a sticker to the dispensers to coat the dispensers to facilitate attachment to living organisms in the area;

(b) transferring the coated dispensers to a surface of a rotating primary distribution device, said distribution device upon rotation causing said dispensers to be discharged at a discharge location from said primary distribution device in a broadcast pattern; and

(c) interposing a secondary distribution device within the broadcast pattern of the primary distribution device, said secondary distribution device having a rotating geometrical surface which intercepts at least a portion of the discharged dispensers causing them to be deflected and redirected thereby altering the normal pattern of the primary distribution device.

4,401,267

TORCH

Carroll D. Spainhour, Princeton Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,356

Int. Cl.³ B05B *15/00*

U.S. Cl. 239—132.3 **5 Claims**

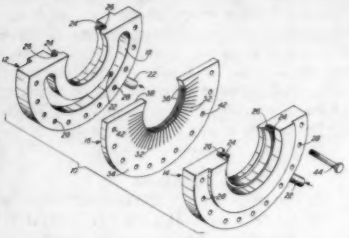
1. A torch comprising:

a plate;

first and second outer members arranged such that the plate is captured therebetween;

each outer member having a cavity therein which opens toward the plate which isolates said cavities;

inlet means for directing gas into each cavity; and



the plate having a plurality of grooves on each major surface thereof, arranged in an interleaved relationship, the grooves extending from the respective cavities in the outer members to an outer edge of the plate to form a plurality of gas outlets.

4,401,268

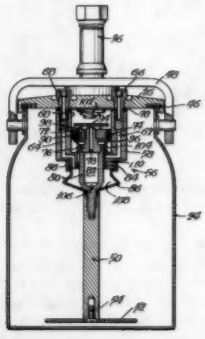
SPRAY GUN WITH PAINT AGITATOR

Edward A. Pomponi, Jr., Boulder, Colo., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Sep. 2, 1981, Ser. No. 298,765

Int. Cl.³ B01F *13/00*

U.S. Cl. 239—142 **5 Claims**



1. In a spray gun assembly of the type including a hand operated spray gun and an associated supply container, the improvement comprising an agitating mechanism for mixing the contents of the supply container including, in combination, an agitator carrying member one end of which extends into the interior of said container; an agitator paddle disposed interiorly of said container and mounted on said one end of said carrying member; and motor means connected with an opposite end of said carrying member for reciprocating said carrying member and thereby said paddle along a linear path, whereby said paddle agitates contents of said container, wherein said agitator paddle is generally flat and planar and is reciprocated along a path generally perpendicular to the plane thereof, and wherein said motor means comprises an air motor which receives air under pressure and reciprocates said agitator paddle in both directions along said liner path solely by means of the air under pressure, said motor means being automatically reversible in its directions of operation in response to the continuous application of air under pressure thereto.

4,401,269

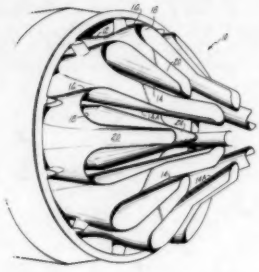
LOBE MIXER FOR GAS TURBINE ENGINE

Donald C. Eiler, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 26, 1980, Ser. No. 191,184

Int. Cl.³ F02K *1/26*

U.S. Cl. 239—265.17 **3 Claims**



1. A lobe mixer for a fan jet engine having coannular streams one of which flows from the fan and the other flows from the core of the engine, said mixer having a generally cylindrically shaped body disposed parallel to said coannular streams and having a sinusoidal portion on the rearward end with respect to the direction of flow of said coannular streams, the sinusoidal portion defining open ended chutes in alternate increasing diameter and decreasing diameter in the axial extending direction relative to the centerline of said cylindrically shaped body, the increasing diameter chutes adapted to direct the core stream and the decreasing diameter chutes adapted to direct the fan stream, both fan stream and core stream mixing at the discharge end of said mixer, at least some of said decreasing diameter chutes extending axially from the increasing diameter chutes and some of said decreasing diameter chutes extend further radially inwardly toward the centerline relative to the other of said decreasing diameter chutes.

4,401,270

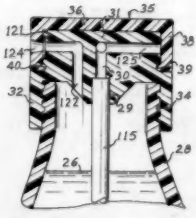
SPRAYER FOR SQUEEZE BOTTLE

James C. McKinney, 555 Kings Peak, Alpharetta, Ga. 30201

Filed Aug. 14, 1981, Ser. No. 292,951

Int. Cl.³ B65D *1/32*

U.S. Cl. 239—327 **7 Claims**



1. A sprayer, for use with a squeeze bottle wherein said bottle is squeezed to raise the liquid level and create air pressure within said bottle and to force liquid through a tube, said sprayer including a body closing said bottle, an air passage defined in said body, a dip tube extending from said body into the liquid, a liquid passageway defined in said body and communicating with said dip tube, a ring generally circumferentially of said body and movable relative to said body, a mixing chamber defined between said ring and said body so that said body provides the inner wall of said mixing chamber and said

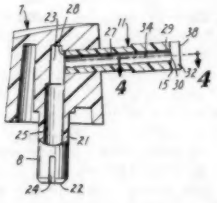
ring provides the outer wall of said mixing chamber, said air passage extending from within said bottle above the liquid level to said inner wall of said mixing chamber in a location generally centrally of said mixing chamber, at least one liquid feed tube in communication with said liquid passageway, a liquid passage connecting said liquid feed tube to a side of said mixing chamber, an orifice defined in said ring, said orifice being selectively movable to a position wherein said orifice is within said outer wall of said mixing chamber generally aligned with said air passage, the arrangement being such that air passes through said air passage, through said mixing chamber, then through said orifice, and liquid passes through said liquid feed tube, through said liquid passage, and into said mixing chamber to engage the side of the stream of air.

4,401,271

AEROSAL FAN SPRAY HEAD

Dennis D. Hansen, Luck Township, Polk County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 10, 1981, Ser. No. 282,243
Int. Cl.³ B65D *83/14*
U.S. Cl. 239—337 **22 Claims**



1. An aerosol can for spraying a polymer in a fan-shaped pattern comprising:

a can;

a valve mounted on said can;

a spray head including:

(a) a generally cylindrical inlet stem having an inlet end portion slideably and sealably mounted in said can valve and an outlet end portion, a central passageway between said inlet and outlet end portions, and at least one fluid metering passage through the side wall of said stem proximate said inlet end portion and communicating with said central passageway; and

(b) a nozzle portion attached to said outlet end portion of said stem, said nozzle portion having an elongate groove which defines a terminal surface for said nozzle portion, said groove having a major axis, said nozzle portion further having an elongate chamber extending generally transverse to said stem with a central axis, an outlet end, and an inlet end communicating with said central passageway, and an orifice communicating with said outlet end of said elongate chamber and opening through said terminal surface, said orifice forming an elongate intersection with said terminal surface as viewed along said central axis, being generally centered in said groove, and having a major axis which is generally aligned with said major axis of said groove, wherein said major axis of said groove is longer than said major axis of said orifice;

a solution contained within said can of a polymer having a minimum number average molecular weight of approximately 10,000 and a solvent, the percentage by weight of said polymer in said solution being a value at which said solution exhibits non-Newtonian viscoelastic properties; and

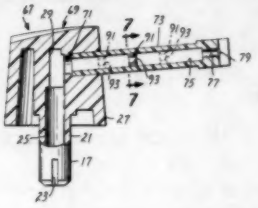
a propellant contained within said can which generates a pressure within said can and is sprayed with said solution.

4,401,272

AEROSOL FAN SPRAYHEAD

Wilfred R. Merton, Stillwater, and Jerome A. Pieterick, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 17, 1982, Ser. No. 378,789
Int. Cl.³ B65D *83/14*
U.S. Cl. 239—337 **14 Claims**



1. In the combination of an aerosol container including a valve and a sprayhead assembly including a generally cylindrical inlet stem having an inlet end portion slideably and sealably mounted in the valve and an outlet end portion, a central passageway between said inlet and outlet end portions, and at least one fluid metering passage through the side wall of said stem proximate said inlet end portion and communicating with the central passageway and a nozzle portion attached to the outlet end portion of the stem, the nozzle portion having an elongate groove which defines a terminal surface for the nozzle portion, the groove having a major axis, the nozzle portion further having an elongate chamber extending generally transverse to the stem with a central axis, and outlet end, and an inlet end communicating with the central passageway, and an orifice communicating with the outlet end of the elongate chamber and opening through the terminal surface, the orifice forming an elongate intersection with the terminal surface as viewed along the central axis, being generally centered in the groove, and having a major axis which is generally aligned with the major axis of the groove, wherein the major axis of the groove is longer than the major axis of the orifice, the container being filled with a solution of a polymer having a minimum number average molecular weight of approximately 10,000 and a solvent, the percentage by weight of the polymer in the solution being a value at which the solution exhibits non-Newtonian viscoelastic properties, and a propellant which generates a relatively low pressure within the can and is sprayed with the solution in a fan-shaped pattern by slidingly depressing the sprayhead into the valve, the improvement comprising:

restriction means disposed between said inlet end portion and said orifice and having a cross-sectional area substantially less than that of said inlet passageway, said inlet chamber or said outlet passageway for increasing uniformity of said spray pattern.

4,401,273

TWO-PIECE LOW VOLUME SPRAY DEVICE

Donald O. Olson, 5885 Dartmouth St., Chula Vista, Calif. 92010

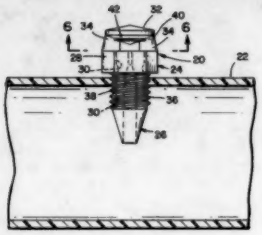
Filed Mar. 16, 1981, Ser. No. 243,723
Int. Cl.³ B05B *1/26*
U.S. Cl. 239—498 **9 Claims**

1. A low pressure spray device adaptable for connection with a fluid conduit of an irrigation system, said device comprising:

an upper body member having an enlarged head portion with a central bore, a deflector member spaced above said upper body member supported by integral post means on said head portion and having a bottom surface aligned with said central bore, and an integral tubular lower portion extending below said head portion having external

threads for securing said device within said conduit and a bore that is a continuation of said central bore;

a lower body member having a tubular upper portion with



an outer cylindrical surface that fits within the bore of said upper body, and a lower end portion having a tapered surface, said lower body member having a central passage aligned with said bottom surface of said deflector member.

4,401,274

CONTAINERS FOR USE IN ELECTROSTATIC SPRAYING

Ronald A. Coffee, Haslemere, England, assignor to Imperial Chemical Industries PLC, London, England

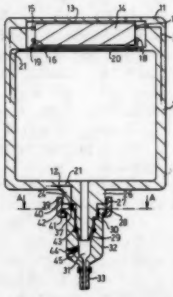
Filed Mar. 4, 1981, Ser. No. 240,287

Claims priority, application United Kingdom, Mar. 20, 1980, 8009490

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—690 **6 Claims**



1. A liquid container adapted to form part of apparatus for electrostatic spraying, the apparatus including a power supply, a high voltage generator, a spray nozzle at least part of the surface of which is electrically conductive, an electrode disposed adjacent the nozzle and insulated therefrom, with electrical connections for connecting the power supply to the input terminals of the generator, the electrode to one output terminal of the generator and the nozzle to the other output terminal of the generator; the container being formed so as to support and carry the generator, and having an orifice for delivering liquid, mounting means for locating the container in the apparatus in a position in which the orifice can deliver liquid to the spray nozzle, the mounting means including electrical contacts and conductors for completing said electrical connections to the generator terminals from the power supply, the nozzle and the electrode.

4,401,275

ARRANGEMENT IN CONNECTION WITH NOZZLES OF POWDER SPRAYERS OR FOR DISINTEGRATION AND DISTRIBUTION OF SOLID PARTICLES IN POWDER FORM IN A GAS STREAM

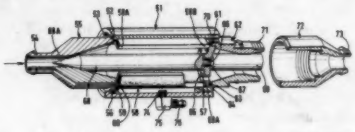
Jan T. Ruud, Fregattgränd 1, S. 440 74 Hjälteby, Sweden

Filed Dec. 30, 1980, Ser. No. 221,444

Claims priority, application Sweden, Jan. 4, 1980, 8000066; May 20, 1980, 8003751

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—704 **8 Claims**



1. Device for the disintegration and distribution of solid particles in powder form transported in a gas stream from a powder hopper to a powder sprayer in which the powder is electrostatically charged when it is transported in a number of curved tubes therein of long extension and small diameter, said device being disposed upstream of said powder sprayer and comprising a tube-shaped component made of porous material to transmit air through which said powder is transported, means for the introduction of a gas stream under pressure in the stream of powder in said component flowing from the hopper on its way to the powder sprayer, and a disc in said component provided with a plurality of through openings which have a maximum diameter corresponding to the diameter of the curved tubes, whereby the powder is mixed with the gas stream under pressure and lump and other large sized agglomerations are disintegrated before its transportation into the curved tubes.

4,401,276

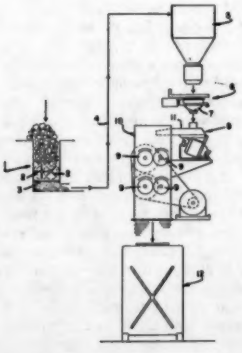
METHOD FOR DEAGGLOMERATING SINTERED PHOSPHORS

John A. Arbie, Sr., Bradford, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 16, 1981, Ser. No. 322,033

Int. Cl.³ B02C *19/12*

U.S. Cl. 241—29 **5 Claims**



1. A method of deagglomerating sintered phosphors comprising the steps of: feeding chunks of the sintered phosphors into a crushing machine to break the chunks into pieces small enough to be vacuum-transported; vacuum-transporting said pieces to a vacuum tank; permitting said pieces to drop from

the vacuum tank into a solid flow control device, for separating and distributing the phosphor pieces into a uniform flow; permitting said pieces to uniformly flow into a feeder having a discharge end which is disposed directly above a first pair of parallel, slightly spaced apart rolls of a roll crusher; crushing said phosphor pieces between said first pair of rolls; and further crushing said phosphor pieces between a second pair of parallel, slightly spaced apart rolls of said roll crusher, said second pair being disposed directly below said first pair and having a smaller gap than the gap between said first pair.

4,401,277
APPARATUS FOR PRODUCING MECHANICAL WOOD PULP

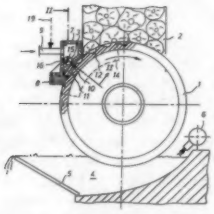
Helmut Thumm; Theodor Bähr, and Hans Henrich, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,064

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014802

Int. Cl.³ B02C *19/12, 23/18*

U.S. Cl. 241—38 **23 Claims**



1. Apparatus for producing mechanical wood pulp, comprising:

a rotatable, roller-type wood grinding stone having a grinding surface; a wood supply chute for supplying wood to the grinding surface of the grinding stone as the grinding stone rotates past the chute;

a water supply device for supplying water to the grinding surface of the grinding stone in the vicinity where the grinding chute supplies wood to the grinding surface; the water supply device comprising:

a closed water supply means for supplying water at a temperature ranging above 100° C. under pressure to maintain said temperature, the closed water supply means comprising a housing extending circumferentially of the grinding stone for a limited arcuate extent and extending axially of the grinding stone for substantially the full width thereof; said housing being closed to maintain pressure on the water therein and being open on a first side adjacent the grinding stone; the housing including second sides meeting the first side and closing off the housing and the second sides of the housing closely abutting the grinding stone to form, together with the surface of the grinding stone, a pressurized water retaining chamber; the first side of the housing including water transmitting means for transmitting water to the grinding surface of the grinding stone while substantially maintaining the temperature and pressure of the water; the water transmitting means being located at the grinding surface in front of the supply chute as viewed in the direction of the rotation of the grinding stone.

4,401,278
APPARATUS FOR GRANULATING COAL

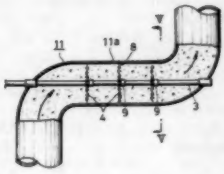
Etsuo Ogino; Nobuo Yoshii, and Kazuo Harada, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Mar. 24, 1981, Ser. No. 247,188

Claims priority, application Japan, Mar. 28, 1980, 55-40920; Mar. 28, 1980, 55-40921; Mar. 28, 1980, 55-40922; Apr. 15, 1980, 55-49874; Apr. 15, 1980, 55-51298[U]; Nov. 20, 1980, 55-164189

Int. Cl.³ B02C *23/36*

U.S. Cl. 241—46.17 **10 Claims**



1. A granulating apparatus, comprising in combination

a duct adapted to hold a slurry of particulate to granular coal, and including a plurality of duct sections and liquid-retaining portions, each liquid-retaining portion being disposed downstream of a duct section corresponding thereto, and subtending a predetermined angle with a next duct section downstream thereof, said slurry having a binder incorporated therein, and

a plurality of rotary agitators disposed in said duct in series, each agitator being disposed in a corresponding liquid-retaining portion, and including

a rotatable shaft, and

a plurality of agitating blades, each blade extending radially outwardly from said shaft, at least some of said blades being made of netting,

whereby, upon flow of said coal slurry through said duct, and upon rotation of said agitators, said binder is made to effectively adhere to the surfaces of the granular coal particles, and said coal particles are granulated efficiently with a wide size distribution.

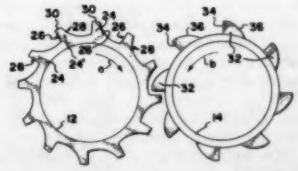
4,401,279
SYNCHRONOUSLY COUNTER-ROTATING INTERMESHING DIFFERENTIAL SPEED CRUSHER ROLL ASSEMBLY

Achilles P. DeVita, Hallandale, and Manley C. Watkins, Titusville, both of Fla., assignors to General Steel Industries, Inc., St. Louis, Mo.

Filed Aug. 27, 1981, Ser. No. 296,897

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—236 **6 Claims**



1. In a crusher roll assembly having radially intermeshing, first and second toothed crusher rolls, with a nip between them, mounted for, and driven in, coordinated counterrotation about spaced parallel axes to crush material fed into the nip between the rolls; the number of teeth on said second roll being

less than the number of teeth on said first roll; and means for driving said second roll at a higher rate of rotation than said first roll; the improvement wherein the leading edge of each tooth on said first roll is a concavely curved surface and the trailing edge of each tooth on said first roll is a substantially flat surface substantially radial to the axis of said first roll, said leading and trailing tooth edges on the first roll being connected by lands; each tooth on said second roll having a leading edge surface defined by a substantially flat surface and a convexly curved trailing edge surface generally complementary in shape to the leading edge surface of a tooth on said first roll; the teeth on the second roll being connected by roots which intermesh with said lands on the first roll; the teeth on the first and second rolls being radially opposite and the axes of rotation of said rolls being spaced from each other by a distance such that the teeth on the respective rolls move in overlapping paths through the nip between the rolls with the teeth on the respective rolls maintained in spaced relationship to each other; the tooth spacing on said respective rolls being such that counterrotation of said rolls advances the substantially flat leading edge surface of a first tooth on the second roll toward the concave trailing edge surface of a first tooth on the first roll, while disposing the trailing convex edge surface of a second tooth on the second roll which is immediately downstream from said first tooth on the second roll generally opposite the leading concave edge surface of a second tooth on the first roll which is immediately downstream of said first tooth on the first roll, the substantially flat leading edge surface of the second tooth on the second roll at this time being generally opposite and generally parallel to the substantially flat trailing edge of still a third tooth on the first roll which is immediately downstream of said second tooth on the first roll.

4,401,280

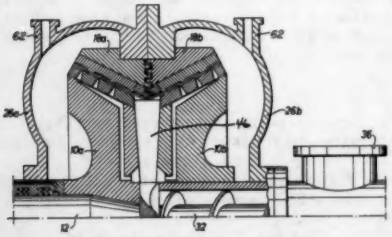
DISC-TYPE PULP REFINING APPARATUS

Ulf Reinhall, Bellevue, Wash., assignor to Sunds Defibrator, Inc., Minneapolis, Minn.

Filed Sep. 8, 1980, Ser. No. 184,747

Int. Cl.³ B02C *23/02*

U.S. Cl. 241—247 **8 Claims**



1. In an apparatus for refining lignocellulosic pulp stock, such as wood chips, sawdust, bagasse and the like, in which the pulp stock is ground in a grinding zone extending axially at an angle to the axis of rotation of a pair of opposed disc members, which rotate relative to one another within a housing in the environment of a fluid medium, said grinding zone being defined between a rotating grinding element carried by an outer peripheral portion of at least one of said opposed disc members, said grinding zone extending at an angle from an inner portion of at least one of said opposed disc members, said inner portion extending radially outwards from the axis of rotation, and a facing correspondingly inclined stationary grinding element mounted in said housing, the pulp stock being advanced by conveyor means into a central opening in said inner portion and discharged from said housing by valve means after completion of the grinding operation, the improvement comprising:

a plurality of sector-shaped channels in said inner portion for receiving the pulp stock from said central opening and accelerating it toward said grinding zone under the influence of the centrifugal force generated by the relative rotational movement of said opposed disc members, the axial width of said sector-shaped channels being defined by two spaced annular wall members in said inner portion and the sector area of said channels being defined by a plurality of rotatable blades disposed between said walls.

4,401,281

BELT CLAMPS FOR VEHICLE OCCUPANT RESTRAINT BELT SYSTEMS

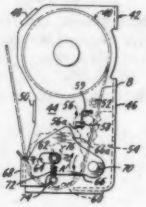
Juichiro Takada, 3-12-1, Shinmachi Setagayaku, Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,364

Claims priority, application Japan, Jul. 3, 1980, 55-9292[U]; Sep. 24, 1980, 55-134793[U]; Nov. 19, 1980, 55-164812[U]

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.2 **12 Claims**



1. A belt clamp for use in conjunction with an emergency locking retractor in a vehicle occupant restraint belt system comprising a U-shaped frame having a pair of side members, a pair of spaced-apart levers, one on either side of the frame, substantially rigidly joined together and mounted on the frame for rotation about an axis transverse to the side members, a belt turning roll having the belt looped around it and having a shaft carried by the lever arms for rotation about an axis spaced apart from and parallel to the axis of rotation of the levers, the turning roll and levers constituting a clamp-actuating structure, matching elongated guide holes in the side members receiving the respective end portions of the shaft, a fixed clamping jaw affixed to the frame on one side of and closely adjacent to the path of the belt as it leads toward the turning roll, a movable clamping jaw located on the other side of the path of the belt and mounted on the frame for movement toward and away from the fixed clamping jaw, and at least one spring urging the turning roll in a direction opposed to the pull-out direction of the belt from the turning roll, the turning roll, levers and clamping members being located on the frame such that upon locking of the retractor and upon imposition of a pull-out force on the belt above a selected level, the clamp-actuating structure translates into engagement with the movable clamping jaw and moves it toward the fixed clamping jaw, thereby to clamp the belt between the jaws against pulling out from the retractor.

4,401,282

EMERGENCY LOCKING SEAT BELT RETRACTOR

Hiroyuki Miki, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 290,072

Claims priority, application Japan, Aug. 19, 1980, 55-117029[U]

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **13 Claims**

7. An energency locking seat belt retractor comprising:

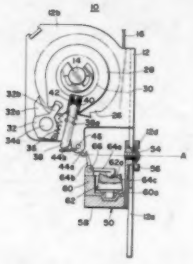
a housing (**12**);

a belt take-up shaft (**14**) rotatably disposed in said housing for winding thereon a seat belt (**16**);

biasing means (**18**) for biasing said belt take-up shaft to rotate about its axis in a direction to retract said seat belt;

a locking device (**22**) for locking, when actuated, said belt take-up shaft against rotation in a direction to unroll said seat belt from said shaft;

a shock sensing device (**5**) for sensing a predetermined degree of shock applied thereto, said device including a pendulum plate (**52**) having an upper portion pivotally connected to said housing, a sensor base (**60**) secured to said pendulum plate and having at its upper surface a blind hole (**60***a*) and a sensor weight (**62**) which is set in said blind hole in such a manner that in a stationary or normal condition, said sensor weight stands straight, but upon receiving a predetermined inertia force, said sensor weight is inclined; and



a movement transmitting device (**44, 64**) for actuating said locking device when said shock sensing device moves upon sensing the predetermined degree of shock, said movement transmitting device including a wing element (**64**) pivotally mounted on said sensor base and provided with angularly spaced first and second wing portions (**64***a*, **64***b*), said first wing portion being in contact with the top of said sensor weight (**62**), a link (**44***t*) disposed in said housing to be rotatable about the axis thereof, said link being formed with axially spaced first and second arms (**44***a*, **44***b*) which are in contact with said second wing portion of said wing element and a part (**38**) of said locking device (**22**), respectively, said part of said locking device inducing the locked condition of said belt take-up shaft when moving in a given direction.

4,401,283

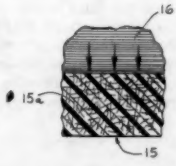
YARN TUBE

Douglas M. Kelley, P.O. Box 1131, Greenwood, S.C. 29646

Continuation-in-part of Ser. No. 206,156, Nov. 12, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,472

Int. Cl.[3] **B65H** *75/10*

U.S. Cl. 242—118.32 **3 Claims**



1. A reuseable and as necessitated recycleable yarn tube for winding polypropylene yarn and the like upon spindles without crushing or excessive inward deformation of the tube as would obstruct doffing comprising:

a molded elongated cylindrical tube having a wall thickness of from about 0.2 inches to about 0.3 inches and an inside diameter of at least approximately 3¼ inches;

said tube being formed by injection molding of a nonfoamed composition including a thermoplastic polymer having a fibrous reinforcement content of from about 5–45% and a compatible coupling agent affording compressive strength at least on the order of about 9500 psi at 23° C.;

whereby said yarn tube may be received upon spindles having spaced ribs and the like after repeated usage.

4,401,284

COLLAPSIBLE MAGNUS-EFFECT ROTOR

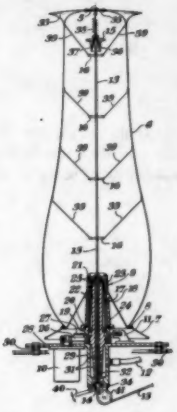
Kenneth A. Austin, 3 Longlands Spinney, Worthing, West Sussex BN14 9LB, England

Filed Mar. 17, 1981, Ser. No. 244,622

Claims priority, application United Kingdom, Mar. 20, 1980, 8009369

Int. Cl.[3] **B64C** *27/00*

U.S. Cl. 244—21 **3 Claims**



1. Apparatus for producing aerodynamic lift comprising:

(a) a collapsible envelope of a flexible material, adapted to be inflated to form a self-supporting tubular rotor having a rotational axis, an exterior wall of said envelope being adapted to be exposed to ambient pressure on one side and an internal pressure greater than said ambient pressure on another side to be deformable locally thereby in response to local pressure variations;

(b) means for inflating said envelope;

(c) means for rotating said envelope in an inflated condition about said rotational axis; and

(d) an elongate flexible member extending axially of and within the envelope, the flexible member being secured by bearing means to one end of the envelope and extending to the other end thereof, whereby pulling of the flexible member assists collapse of the envelope.

4,401,285

AIRCRAFT UNDERCARRIAGE UNIT

John H. J. Simmonds, Kingston-upon-Thames, England, assignor to British Aerospace Public Limited Company, London, England

Filed Apr. 21, 1981, Ser. No. 256,252

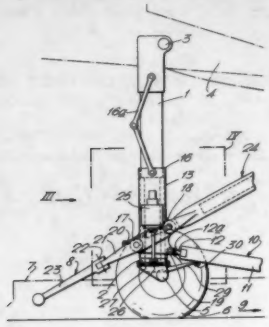
Claims priority, application United Kingdom, Apr. 30, 1980, 8014207

Int. Cl.[3] **B64C** *25/50, 25/58*

U.S. Cl. 244—100 R **9 Claims**

1. An aircraft undercarriage unit which includes an upper leg member arranged to be attached to an aircraft structure, a lower leg member carrying ground wheel means being in axially slidable association with the upper leg member to form a telescopic shock absorber, a load transmitting sleeve member surrounding a portion of the lower leg member adjacent the

ground wheel means and dimensioned so as to receive a lower portion of the upper leg member, and constraining means to locate the sleeve member with respect to the lower leg member



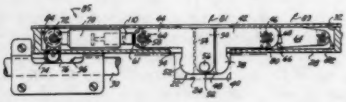
and the upper leg member but which allow telescopic movement of the leg members, the sleeve member having anchorage means through which towing loads are accepted and transmitted.

4,401,286

SHEAR OR COMPRESSION RELEASE LOCK

Faisal A. Naffa, Sterling Heights, Mich., assignor to Brooks & Perkins, Inc., Livonia, Mich.

Filed Apr. 6, 1978, Ser. No. 894,135
Int. Cl.³ B64D *9/00*; B60P *7/13*
U.S. Cl. 244—137 R **35 Claims**



30. A pallet locking structure for a pallet movable longitudinally in an aircraft rearwardly toward and through a rear opening in said aircraft from a locked position within the aircraft under the influence of parachute means deployed behind the aircraft in flight,

locking means engageable with said pallet to retain said pallet in locked position until the force applied by said parachute means attains a predetermined value,

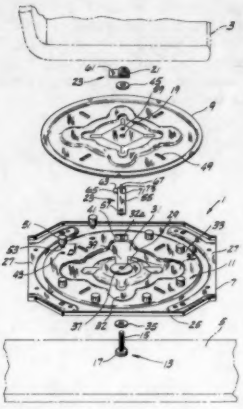
pressure responsive release means operably connected to said locking means and responsive to the force exerted by said parachute means to release said locking means upon attainment of such predetermined force by said parachute means, said release means comprising a fuse plate, a punch, and means for applying between said punch and plate a force proportional to the force applied by said parachute means in a direction to cause said punch to penetrate said fuse plate upon attainment of a force applied to the pallet by said parachute means predetermined by the material and thickness of said fuse plate and the cross-sectional area of said punch.

4,401,287

SWIVEL ASSEMBLY

Denis S. Moeser, Clayton, Mo., assignor to Leisure Products, Inc., St. Louis, Mo.

Filed Jul. 31, 1981, Ser. No. 289,110
Int. Cl.³ F16M *13/00*; A47C *3/18*
U.S. Cl. 248—425 **12 Claims**



1. A swivel assembly comprising:

a base plate;

a swivel plate mounted on the base plate for rotation relative to the base plate in a plane generally parallel to but spaced from that of the base plate;

bearing means between the opposing inner faces of the plates;

means for adjusting the resistance of the swivel plate to rotation relative to the base plate comprising first and second fastening members, the first fastening member comprising a bolt having a head on the outer face of one plate, and a threaded shank extending through axially aligned holes in the plates and defining an axis about which the swivel plate rotates, and the second fastening member comprising a nut on the outer face of the other plate threadable on the shank of the bolt for drawing the swivel plate toward the base plate against said bearing means thereby to adjust the resistance of the swivel plate to rotation relative to the base plate, both fastening members being freely rotatable relative to said plates, one of the fastening members being accessible for being turned from the outer face of the base plate and the other fastening member being rendered generally inaccessible by an object mounted on the outer face of the swivel plate;

and locking means for selectively holding the inaccessible fastening member in fixed angular position relative to the swivel plate to ensure relative rotation of the fastening members upon turning the accessible fastening member, whereby the resistance of the swivel plate to rotation may be adjusted.

4,401,288

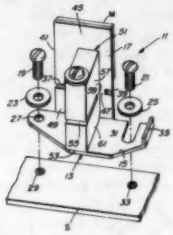
ADJUSTABLE OPTICAL MIRROR MOUNT

Corey M. Thompson, Medway, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Mar. 13, 1981, Ser. No. 243,614
Int. Cl.³ A47G *1/24*
U.S. Cl. 248—476 **9 Claims**

4. An optical mirror mount for use in mounting an optical mirror in an upright position on a horizontal supporting surface and which is adjustable in pitch and yaw comprising an L-shaped bracket having a horizontal leg and a vertical leg,

said horizontal leg having a mounting hole and a mounting slot, a first pair of mounting screws for securing said horizontal leg to said supporting surface, one of said screws extending through said mounting hole and the other of said screws extending through said mounting slot, said mounting slot permitting rotational movement of said bracket about a vertical axis extending through said mounting hole so as to allow for adjustment of said bracket in yaw, said vertical leg having an upper section, for supporting the optical mirror and a lower section, said upper section being bendable relative to said lower section, and adjustable flexure spring means attached to said upper



section of said vertical leg and said horizontal leg for bending said upper section of said vertical leg relative to said horizontal leg so as to provide for adjustment of said bracket in pitch, said adjustable flexure spring means comprising a flexure spring block and an adjusting screw for adjusting the tension on said flexure spring block, said flexure spring block including an upper portion and a lower portion, said upper portion being bendable relative to said lower portion, said upper portion of said flexure spring block being rigidly secured to the upper section of said vertical leg of said bracket and said lower portion of said flexure spring block being rigidly secured to said horizontal leg of said bracket.

4,401,289

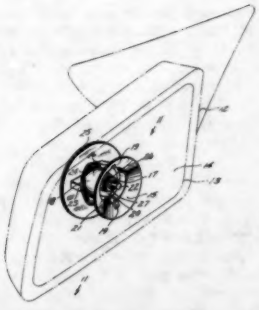
ADJUSTABLE MIRROR STABILIZING MOUNTING

Robert J. Fisher, Livonia, Mich.; Arthur C. Jaworowicz, Jackson, Tenn.; John M. Lyle, Germantown, Tenn.; Jerry W. Sellers, Lexington, Tenn., and Gary R. Steed, Medon, Tenn., assignors to Harman Automotive, Inc., Detroit, Mich.

Filed Mar. 20, 1981, Ser. No. 245,913

Int. Cl.³ B60R *1/02*

U.S. Cl. 248—483 **6 Claims**



1. An adjustable mirror stabilizing mounting comprising:

a glass case having inner and outer spherical concentric surfaces surrounding an opening on an axis through the center of said spherical surfaces and said case having trunnion slots flanking the axis of said opening;

a spherical sector retainer, said outer spherical sector mating with said inner spherical concentric surface of said case and having transversely extending trunnions relatively movable in said slots and said spherical sector retainer keyed against rotation;

a stud through said case and said spherical retainer keyed to said spherical retainer;

a spherical support surface on the axis of said stud engaging said outer spherical surface of said glass case; and

lineally acting spring means supported on said stud pressing said spherical sector retainer into keyed relation on urging said glass case into firm limitedly movable engagement with said spherical support surface.

4,401,290

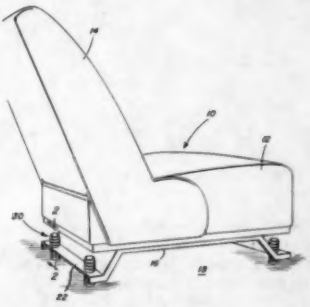
STABILIZED SEAT

Jack B. Butler, Kilgore, Tex., assignor to 4-S Oil Company, Inc., Kilgore, Tex.

Filed Mar. 23, 1981, Ser. No. 246,850

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—565 **4 Claims**



1. A seat and seat stabilizer therefor, said seat stabilizer comprising vibration dampening means to support said seat, said vibration dampening means being secured to a permanent floor structure and supporting said seat for relative vertical movement with said floor structure, said vibration dampening means comprising a cushioning means to control relative movement of said seat, said cushioning means including coil spring means, said vibration dampening means being secured to said floor structure by a support means, said seat being mounted on said support means in a manner to provide relative movement with said support means, said coil spring means being mounted on said support means to control the movement of said seat, said support means and said coil spring means being enclosed within a flexible cover, said coil spring means being in the form of an upper coil spring and a lower coil spring, said seat being mounted on said support means between said upper and lower coil springs, a bushing mounted on said seat in contact with said support means, said bushing reducing the wear of said seat during movement relative to said support means.

4,401,291

CONCRETE WALL FORM WITH SAFETY ATTACHMENT

Anthony J. Gallis, Lake Hiawatha, N.J., assignor to Harsco Corporation, Camp Hill, Pa.

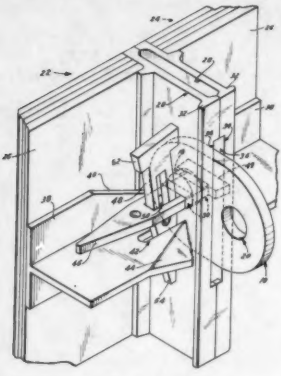
Filed Feb. 4, 1981, Ser. No. 231,492

Int. Cl.³ E04G *11/00, 17/04*

U.S. Cl. 249—196 **7 Claims**

1. A concrete wall form assembly with an attachment for anchoring the hook element of a worker's safety belt to said assembly comprising a plurality of panels arranged edge to edge, each panel comprising an inner facing from which there projects outwardly a marginal supporting frame including

vertical and horizontal siderails, said siderails having inner and outer side surfaces, the siderails of at least one pair of adjacent panels being arranged contiguously and having formed at correspondingly spaced intervals therealong a plurality of respectively aligned pairs of wedge-bolt-receiving slots extending through the contiguous siderails, said siderails further having longitudinal ribs projecting outwardly and parallel to said facing from the extremity of said siderails most-removed from said facing, said ribs having notches in alignment with said pairs of wedge-bolt-receiving slots, the corresponding notches of contiguous siderails being disposed in registration



with one another and defining voids in alignment with at least some of said pairs of wedge-bolt-receiving slots, a wedge bolt mounted in at least one of said pairs of wedge-bolt-receiving slots, an attachment in the form of a strong plate having two spaced holes with said first hole pivotally accommodating said wedge bolt and thereby securing said plate within one of said voids and with said plate having a second hole spaced from said first hole sufficiently to be capable of being positioned beyond said rails and being adapted to receive said hook element, and a second wedge bolt locking said first wedge bolt in place, whereby said attachment is pivotally secured in one of said voids by said first wedge bolt.

4,401,292

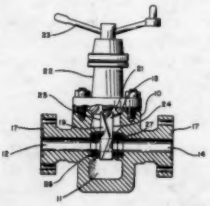
VALVE SEAT STRUCTURE

William L. Whaley, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 21, 1982, Ser. No. 340,951

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—172 **11 Claims**



1. In a gate valve structure having a valve body with a valve chamber and inlet and outlet flow passages communicating with the valve chamber and defining a flowway through said valve body, an expanding gate assembly mounted in said valve chamber for movement between open and closed positions relative to said flow passages, said gate assembly including a gate and a segment, each provided with an outer planar sealing surface and expanding away from each other in said open and closed positions, and an annular recess in said valve body surrounding said inlet flow passage and opening to said flow passage and said valve chamber to define a seat pocket having a bottom wall and a circumferential side wall;

an improved metallic seat assembly mounted in said annular recess for sealing against said gate assembly, said seat assembly comprising a main outer ring disposed in substantially coaxial relation with said inlet flow passage and fitting loosely within said annular recess, said outer ring having a rear face and a planar front face disposed within the valve chamber for sealing between the main ring and the adjacent sealing surface of said segment of the gate assembly when the gate assembly is in its expanded condition, said main ring having a counterbore recess formed in said rear face thereof extending axially inwardly therefrom and defining an annular bottom surface in said counterbore recess;

an inner auxiliary support ring fitting loosely within said counterbore recess of the main ring and provided with an axial dimension which exceeds the depth of said counterbore recess, said auxiliary ring having an annular rear face surrounding and adjacent said inlet flow passage and adapted to contact said seat pocket bottom wall to thereby space said main ring from said bottom wall;

and an annular expansible resilient sealing element disposed and compressed between the bottom of said counterbore recess in said main ring and the opposed adjacent face of said auxiliary ring in surrounding relation to said inlet flow passage to urge said rings away from each other and said outer ring to where its front face is flush against the adjacent sealing surface of the gate assembly and said auxiliary ring to where its rear face is flush against the bottom wall of said seat pocket whereby if an out-of-parallel condition exists between said outer sealing surfaces of the gate assembly, pressurized flowline fluid enters between said main ring and auxiliary rings and in the event of a downstream leak, forces said main ring into sealing engagement with the gate assembly and said auxiliary ring seals against the bottom wall of the seat pocket, said annular expansible resilient sealing element being radially expanded against said circumferential wall and compressed between said rings to establish a fluid-tight seal therebetween.

4,401,293

ARRANGEMENT OF FLUID PRESSURE PASSAGEWAYS IN CYLINDER DEVICES

Gerhard Rodewald, Ronnenberg; Detlef Opel, Hæste; Walter Brausfeld, Hanover; Helmut Göttling, Isernhagen; Hans-Friedrich Meyer, and Rudolf Möller, both of Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Steuerungstechnik GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,068

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037674

Int. Cl.³ F16K *27/00*

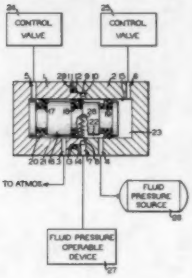
U.S. Cl. 251—324 **3 Claims**

1. An arrangement of a fluid pressure opening connected with respective passageways in a cylindrical housing of a fluid pressure operable valve device, in which at least one sealing element disposed in a member movable in said housing relative thereto, is movable over said opening for connecting fluid pressure medium chambers, said arrangement comprising:

(a) a pair of axially aligned cylindrical housing portions disposed in an end-to-end abutting relation to form said cylindrical housing and providing a coaxial bore in which said member carrying said sealing element is reciprocably movable;

(b) a passageway formed cooperatively by two non abutting cylindrical housing portions to provide communication with the inner space of said housing;

(c) said non abutting cylindrical housing portions having formed on the adjacent ends thereof; a plurality of axially extending interengaging saw-like teeth circumferentially positioned along a portion of said coaxial bore;



(d) said passageway having a generally annular opening into said coaxial bore formed circumferentially in said coaxial bore intermediate respective pluralities of said saw-like teeth.

4,401,294

APPARATUS FOR COILING AND COOLING WIRE ROD

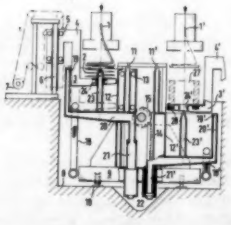
Willi J. Ammerling, Erkrath, and Alfred Muller, Meerbusch-Lank, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,494

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103671

Int. Cl.³ C21D *9/573*

U.S. Cl. 266—112 **7 Claims**



1. Apparatus for cooling and coiling wire rod, comprising a rotary turn-laying head for forming a coil, a coil receiver below the turn-laying head for receiving the turns from the head and carrying the coil formed thereby, means for moving the coil receiver down relative to the turn-laying head from an upper position to a lower position, and a cooling tank mounted for movement between an upper position in which the tank surrounds the coil receiver and a coil carried thereby, and a lower position in which the tank is below a predetermined level permitting a complete coil to be removed sideways from the coil receiver.

4,401,295

APPARATUS FOR TREATING MOLTEN METAL

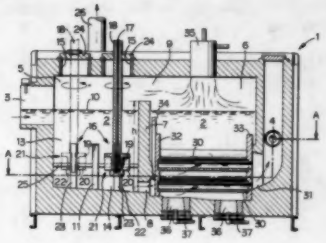
Tsutomu Yoshida, Nagoya, Japan, assignor to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,937

Claims priority, application Japan, May 27, 1981, 56-80289

Int. Cl.³ F27B *3/20*

U.S. Cl. 266—207 **8 Claims**



1. An apparatus for treating a molten metal comprising:

a treating vessel of sealed structure having inlet means for introducing molten metal to be treated and outlet means for discharging treated molten metal;

a partition member vertically extending in said treating vessel to divide same into a fluxing compartment located on the side of said inlet means and a filtration compartment on the side of said outlet means, and having in a lower portion thereof a molten metal passage for leading the molten metal from said fluxing compartment into said filtration compartment, the top of said partition member being spaced from a ceiling portion of said treating vessel to define therebetween a communication space communicating an upper space in said fluxing compartment with an another upper space in said filtration compartment;

molten metal treating means disposed in said fluxing compartment for treating the molten metal introduced through said inlet means, said treating means including a vaned rotor and having treating gas blowing means for blowing a treating gas into said molten metal in the form of fine discrete bubbles while said vaned rotor is rotated to stir and circulate said molten metal;

filtering means for removing suspended particles from said molten metal and delivering the filtered molten metal out of said treating vessel through said outlet means, said filtering means being disposed in said filtration compartment for filtering said molten metal introduced from said fluxing compartment into said filtration compartment through said molten metal passage;

burner means, disposed in said ceiling portion of said treating vessel and located over said filtration compartment, for producing combustion flame and/or combustion gas and high temperature and heating said molten metal in said fluxing compartment as well as the molten metal in said filtration compartment before it is filtered by said filtering means; and

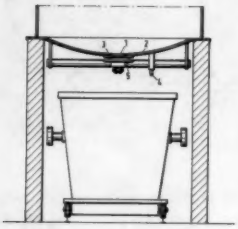
exhaust gas discharging means, supported in said ceiling portion and located over said fluxing compartment, for discharging out of said treating vessel exhaust gas produced in said fluxing compartment, said exhaust gas discharging means introducing combustion gas produced by said burner means into said fluxing compartment through said communication space and discharging said combustion gas out of said vessel, whereby the molten metal in said fluxing compartment is heated by said combustion gas introduced into the fluxing compartment by said exhaust gas discharging means.

4,401,296

ELECTRO-METAL SMELTING FURNACE WITH TAPHOLE ARRANGED AT THE BOTTOM

Klaus V. Ploetz, Kaarst; Ludger Zangs, Essen; Ralf Schneider, Mettmann; Hannsgeorg Bauer, Witten; Josef Otto, Wetter; Manfred Walter, Witten; Helmut Meyer, Witten, and Erich Heinrich, Witten, all of Fed. Rep. of Germany, assignors to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 153,897, May 28, 1980, abandoned.
This application May 22, 1981, Ser. No. 266,314
Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921742
Int. Cl.³ C21C *5/48*
U.S. Cl. 266—236 **3 Claims**



1. Electro-metal smelting furnace comprising:
(a) a furnace bottom having at least one taphole,
(b) a closure plate pivotable between a remote position and a sealing position against the underside of the taphole,
(c) a shaft associated with said furnace and positioned to the side of said taphole at the underside of said furnace bottom,
(d) a lever connecting said closure plate to said shaft,
(e) a first cylinder-piston unit subject to a pressure medium engaging said shaft at one of its ends and engaging a stationary frame element at its other end,
(f) an eccentric pin fixedly connected to said shaft,
(g) a wedge slideably movable between a locking position in the path of movement of said eccentric pin and a non-locking position outside the path of movement of said eccentric pin,
(h) a second cylinder piston unit subject to a pressure medium associated with said wedge, whereby action of said first cylinder piston unit upon the fixed lever causes rotation of said shaft thereby pivotally moving said closure plate between the remote position and the sealing position and whereby action of said second cylinder piston unit upon said wedge causes said wedge to slide between the locking position and the non-locking position.

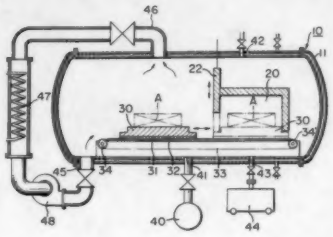
4,401,297

SINTERING FURNACE FOR POWDER METALLURGY

Yoshihiko Doi; Toshikazu Hirayama; Yasushi Miyawaki, and Masao Maruyama, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 123,026, Feb. 20, 1980, abandoned, which is a continuation of Ser. No. 889,446, Mar. 23, 1978, abandoned. This application Aug. 27, 1981, Ser. No. 297,084
Claims priority, application Japan, Mar. 30, 1977, 52-36825
Int. Cl.³ F27B *5/12*
U.S. Cl. 266—252 **2 Claims**

1. A sintering furnace for powder metallurgy of cemented carbides which comprises a main furnace body having a cooling means for cooling the interior of said furnace by a heat exchanger fitted to the exterior of the main furnace body, said main furnace body further containing therein a heating chamber, an inert gas inlet, a movable table to be moved slidably on graphite rails for carrying a workpiece by an endless chain mounted on sprockets, and an exhaust port disposed beneath said heating chamber for removal of a lubricant included in said workpiece, said heating chamber being surrounded by a heat insulator and being provided with a heating element and a door capable of being opened and shut from the outside of



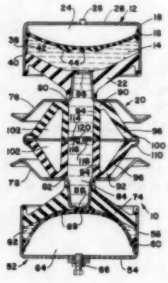
the furnace body, and when said door is in the open position said movable table being insertable in the lower portion of said heating chamber.

4,401,298

FLEXIBLE COLUMN VISCOUS SPRING DAMPER

Gerald E. Eaton, Wakeman, and Emile M. Shtarkman, Norwalk, both of Ohio, assignors to Imperial Clevite Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 208,013, Nov. 18, 1980, abandoned.
This application Nov. 1, 1982, Ser. No. 437,900
Int. Cl.³ F16F *1/54, 3/08*
U.S. Cl. 267—140.1 **6 Claims**



1. A viscous spring damper for damping and leveling low frequency structural agitation in a device comprising:
a first outer member fixedly attached to said device joined to a connecting member by means of a first elastomeric shear spring, said first outer member including a first fluid chamber and a first highly flexible and moveable elastomeric diaphragm;
a second outer member fixedly attached to said device and moveable independently from said first outer member joined to said connecting member by means of a second elastomeric shear spring, said second outer member including a second fluid chamber and a second highly flexible and moveable elastomeric diaphragm;
said connecting member including an open-end conduit having at least one flexible section with rigid end caps at terminal ends, said end caps being connected to said shear springs;
at least one of said outer members includes means for selective gas pressurization of at least one of said elastomeric diaphragms whereby said viscous spring damper is adapted to level a load supported thereby by pressurization of said diaphragm; and
a main fluid chamber in said connecting member communi-

cating with said first fluid chamber and said second fluid chamber, and including restrictive orifice means for restricted flow of fluid whereby relative movement between said members operates to stress said shear springs and said elastomeric diaphragms and vary the overall volume of said chambers.

4,401,299

DEVICES FOR ACCELERATING SHEETS IN GATHERING MACHINES

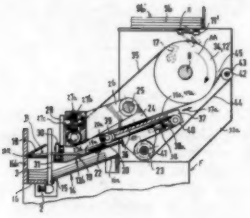
Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Jul. 27, 1981, Ser. No. 287,173

Claims priority, application Switzerland, Jul. 28, 1980, 5750/80

Int. Cl.³ B65H *39/02, 39/055*

U.S. Cl. 270—54 **21 Claims**



1. In a machine for gathering sheets into piles or similar accumulations, the combination of a conveyor having a plurality of spaced-apart entraining means arranged to move in a predetermined direction and along a first predetermined path; a succession of supports adjacent to said path and disposed one after the other, as considered in said direction, each of said supports having a sheet supporting surface and a pair of longitudinal marginal guide portions extending in parallelism with said direction and disposed at the opposite sides of said first path, each supporting surface being disposed between the respective marginal guide portions; transfer means operable to deliver sheets to the surfaces of said supports so that the delivered sheets extend into said path and are removed from the supports by the oncoming entraining means; sheet accelerating devices, one for each of said supports and each movable along an endless second path at a level above the supporting surface of the respective support, said second paths having predetermined portions which are sufficiently close to the respective supporting surfaces to enable the accelerating devices to frictionally engage the sheets on such supporting surfaces, each of said devices having an elongated sheet-engaging surface which is at least substantially parallel to said direction, at least during travel of said devices along said predetermined portions of the respective second paths; means for influencing friction between said supports and the sheets in the regions of said predetermined portions of the respective second paths so that said surfaces of said devices are free to move the sheets with reference to the respective supports during travel along said predetermined portions of the respective second paths; drive means operable to move said devices along the respective second paths so that said devices move in said direction during travel along said predetermined portions of the respective second paths; and means for operating said drive means in synchronism with said transfer means so that each of said devices engages and accelerates a freshly delivered sheet on the surface of the respective support not later than on engagement of such sheet by an oncoming entraining means.

18. In a machine for gathering sheets into piles or similar accumulations, the combination of a conveyor having a plurality of spaced-apart entraining means arranged to move in a predetermined direction and along a first predetermined path; a succession of supports adjacent to said path and disposed one after the other, as considered in said direction, each of said supports having a sheet supporting surface; transfer means operable to deliver sheets to the surfaces of said supports so that the delivered sheets extend into said path and are removed from the supports by the oncoming entraining means; sheet accelerating devices, one for each of said supports and each movable along an endless second path at a level above the supporting surface of the respective support, said second paths having predetermined portions which are sufficiently close to the respective supporting surfaces to enable the accelerating devices to frictionally engage the sheets on such supporting surfaces, each of said devices having an elongated sheet-engaging surface which is at least substantially parallel to said direction, at least during travel of said devices along said predetermined portions of the respective second paths; means for reducing friction between the surfaces of said supports and the sheets in the regions of said predetermined portions of the respective second paths; a plurality of drive means, one for each of said devices and each operable to move the respective device along the respective second path so that said devices move in said direction during travel along said predetermined portions of the respective second paths, each of said drive means comprising a plurality of connectors having first portions articulately connected with spaced-apart portions of the corresponding accelerating devices and second portions, and means for rotating said second portions of said connectors about parallel axes to thereby move the respective accelerating devices along the corresponding endless second paths; and means for operating said drive means in synchronism with said transfer means so that each of said device engages and accelerates a freshly delivered sheet on the surface of the respective support not later than on engagement of such sheet by an oncoming entraining means, each of said rotating means comprising a first endless flexible element receiving motion from said operating means, said operating means comprising a shaft and said transfer means comprising a rotary transfer member for each of said supports, said shaft being arranged to drive said transfer members.

4,401,300

AIR BEARING SHELF

George A. Morin, Aurora, Colo., assignor to Leger' Equipment Corp., Aurora, Colo.

Filed Dec. 21, 1981, Ser. No. 332,739

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—55 **14 Claims**

1. An apparatus for the transport of a pliable jacket having at least first and second leaves in open position, for use in combination with a generally horizontal jacket conveyor adapted to move the jacket in a longitudinal direction above a generally horizontal plane of conveyor movement, said apparatus comprising:

a first jacket leaf transport mechanism including opposed first and second means for delivering pressurized air to form a fluid cushion and defining therebetween a first gap oriented generally above and extending along the plane of jacket conveyor movement, said first and second means being oriented to deliver the pressurized air into the first gap from opposite sides thereof for, in use, permitting movement of the first leaf through the first gap between suspending fluid cushions formed by the pressurized air;

a second jacket leaf transport mechanism, between said first jacket leaf transport mechanism and the plane of conveyor movement, including a third means for delivering pressurized air and defining at least one margin of a second gap longitudinally juxtaposed to said first gap and generally parallel to the longitudinal direction of conveyor movement, the third means being oriented to deliver pressurized air into the second gap for, in use, permitting movement of the second leaf through the second gap in the longitudinal direction with a fluid cushion on at least one side thereof formed by the pressurized air; and

wherein the first and second gaps are offset from each other at an acute angle with respect to the longitudinal direction of conveyor movement, for, in use, maintaining the first and second jacket leaves in open position while passing through the gaps.

11. The method of transporting in open position a pliable jacket having at least first and second leaves joined at a common spine and having free leaf sides opposite from the spine, comprising:

conveying the jacket along a longitudinal, generally horizontal jacket pathway with the spine substantially parallel to the direction of travel;

opening the jacket by raising the first leaf along the free leaf side opposite from the spine;

suspending said raised free leaf side between opposed air cushions formed by pressurized air and defining a longitudinal first leaf side pathway elevated above and generally following the longitudinal jacket pathway; and

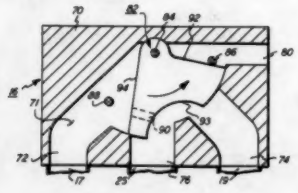
suppressing the free second leaf side under pressurized air forming an air cushion defining one side of a longitudinal second leaf side pathway generally following the longitudinal jacket pathway and substantially coplanar therewith.

4,401,301

SHEET FEEDER CONTROLLED BY FED SHEET

Robert A. Hayskar, Palatine, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 20, 1981, Ser. No. 265,280
Int. Cl.³ B65H *3/12*
U.S. Cl. 271—96 **5 Claims**



1. A sheet feeder for separating and feeding sheets seriatim from a stack of sheets comprising:

a sheet tray for holding sheets to be fed;

a vacuum belt assembly disposed in operative relationship below said tray for contact with the bottom most sheet in said tray;

vacuum control port means located adjacent the discharge side of said tray; and

control valve means interconnected with said vacuum control port means and said vacuum belt assembly for controlling the vacuum supply to the said belt assembly, said control valve means including

a valve body having a valve chamber therein; and

a valve element movably supported in said valve chamber for movement between a sheet feed position and a no feed position, said valve element having a first surface communicating with the atmosphere; a second surface communicating with said vacuum control port means, the area of said valve element first surface being less than the area of said valve element second surface; and

a bleed passage communicating said vacuum control port means directly with said vacuum supply,

movement of the sheet being fed across said vacuum control port means closing off said vacuum control port means to permit pressure on said valve element second surface to be reduced through said bleed passage to cause said valve element to move to said no-feed position wherein said valve element interrupts communication between said vacuum belt assembly and said vacuum supply to release the sheet being fed and prevent premature acquisition of the next sheet by said vacuum belt assembly until the trailing edge of the sheet being fed has moved clear of said vacuum control port means,

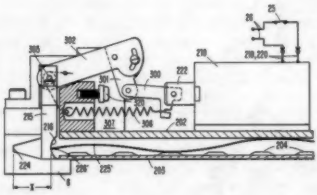
movement of the sheet being fed past said vacuum control port means uncovering said vacuum control port means to increase pressure on said valve element second surface to cause said valve element to move to said sheet feed position wherein said valve element communicates said vacuum belt assembly with said vacuum supply.

4,401,302

SHEET SEPARATION APPARATUS AND METHOD

Eugene C. Hardy, Boulder, and Milan J. Miklos, Westminster, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1981, Ser. No. 260,159
Int. Cl.³ B65H *9/06, 29/58*
U.S. Cl. 271—251 **8 Claims**



1. In apparatus including means for printing indicia on flexible sheets, wherein there are provided:

a plurality of guiding means defining an opening, having an entry and an exit, an arbitrary reference line connecting a point at the entry with a point at the exit, for receiving at the entry sheets from the printing means having edges upredictably aligned with respect to the reference line;

driving means extending through at least one of the guiding means and, in the absence of a sheet, contacting another one of the guiding means, operable to drive sheets along a route from the entry toward the exit at an angle to the reference line;

an improvement for delivering the printed sheets in offset positions, comprising:

a first reference means, coincident with the reference line, for engaging one of the edges of sheets driven fronm the entry to the exit, and thereby aligning edges of these sheets with the line;

a second reference means, aligned relative to but not coincident with, the first reference line, operable to engage one of the edges of sheets driven from the entry to the exit; and

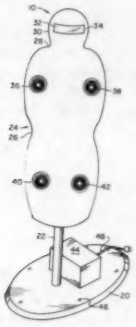
means selectively operable for positioning one of said reference means in and out of intercepting relationship with the edges of sheets driven by the driving means;

whereby the edges of sheets engaged by the second reference means are aligned relative to, but not coincident with, the edges of sheets which engage the first reference means.

4,401,303
ATHLETIC REFLEX MACHINE

Tyrone D. Anderson, 903 N. Kenwood Ave., Baltimore, Md. 21205, and Teng-Fang Lin, 3750 Old York Rd., Baltimore, Md. 21218

Filed Mar. 11, 1982, Ser. No. 357,305
Int. Cl.³ A63B 69/34
U.S. Cl. 272—76 7 Claims

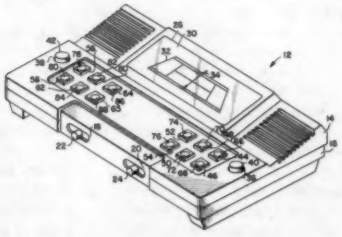


1. In a system providing for a human opponent a human-reflex simulative device for practicing Kung-Fu and the like, including: a body, means holding the body upright, means on the body for striking out at a human opponent, the improvement comprising: means for controlling said striking out, and said means for controlling including means for remotely sensing a said human opponent.

4,401,304
ELECTRONIC TENNIS GAME WITH INTERACTIVE CONTROLS

Nobuo Hamano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 5, 1981, Ser. No. 222,707
Int. Cl.³ A63F 9/00
U.S. Cl. 273—85 G 17 Claims



1. An amusement device, comprising:

a housing;

a limited plurality of manually operable first return buttons mounted on said housing;

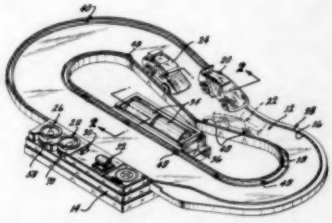
a display panel having first and second sides mounted on said housing, said panel having a limited plurality of projectile segments permanently disposed between the first and second sides of said panel and a limited plurality of first player elements permanently disposed adjacent said first side of said panel, each of said first player elements corresponding to one of said first return buttons and comprising at least one body segment and a limited plurality of peripheral segments, one of said peripheral segments of each first player element being a returning peripheral segment disposed adjacent a corresponding returnable projectile segment; and

first means for sequentially displaying projectile segments along a limited plurality of predetermined first trajectories toward said first side of said panel, each of said first trajectories including at least one returnable projectile segment and at least one first trajectory including a returnable projectile segment corresponding to the returning peripheral segment of one first player element and a returnable projectile segment corresponding to the returning peripheral segment of another first player element, said first means including second means for displaying said at least one body segment of a first player element while sequentially displaying its peripheral segments when the corresponding first return button is depressed as said projectile segments are being displayed along a first trajectory and third means for sequentially displaying projectile segments along a predetermined second trajectory toward said second side of said panel if a returning peripheral segment of a first player element and its corresponding returnable projectile segment are simultaneously displayed, the second trajectory displayed when the returning peripheral segment of said one first player element and its corresponding returnable projectile element are simultaneously displayed being different from the second trajectory displayed when the returning peripheral segment of said another first player element and its corresponding returnable projectile segment are simultaneously displayed.

4,401,305
SIMULATED RACING GAME

Hiroshi Sano, Tokyo, Japan, assignor to Tomy Kogyo Company, Inc., Japan

Filed Apr. 29, 1981, Ser. No. 258,582
Claims priority, application Japan, May 31, 1980, 55-76236
Int. Cl.³ A63F 9/14
U.S. Cl. 273—86 F 15 Claims



1. In a game of the type wherein a housing having a surface is provided with at least two channels depressed below said surface and an endless element moves within each of said channels the improvement which comprises:

at least one first upstanding member attached to one of said endless elements and projecting upwardly from one of said channels wherein said one of said endless elements is located, at least a portion of said first upstanding member projecting above said surface, said projecting portion capable of holding an object;

at least one second upstanding member attached to the other of said elements and projecting upwardly from the other of said channels wherein the other of said elements is located, at least a portion of said second upstanding member projecting above said surface;

a motor located in said housing;

a first transfer means operatively connected between said motor and said one element and capable of moving said element in said one channel, said first upstanding member moving in a continuous pathway above said surface in response to movement of said one element;

a second transfer means operatively connected between said motor and said other element and capable of moving said other element in said other channel, said second upstanding member moving in a second continuous pathway above said surface in response to movement of said other element;

said first and said second continuous pathways converging on a portion of said surface and diverging on the remaining portion of said surface;

a first wheeled vehicle having a plurality of wheels rotatably mounted on axles, said vehicle capable of detachably connecting to said first upstanding member by locating one of said wheels on said projecting portion of said member and said vehicle being moved over said surface as said one upstanding member moves in response to movement of said one element;

a second wheeled vehicle capable of detachably connecting to said second upstanding member and being moved in response to movement of said other element;

said first and said second wheeled vehicles capable of interacting on said portion of said surface wherein said first and said second pathways are convergent, said first and said second wheeled vehicle incapable of interacting on said portion of said surface wherein said first and said second pathway are divergent;

said first transfer means including means capable of regulating the speed of said one of said endless elements in said one channel with respect to the speed of said other of said endless elements in said other channel, said second transfer means maintaining the speed of the other of said endless elements at a constant speed.

4,401,306

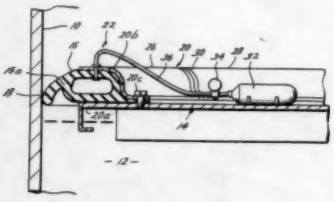
FLOATING ROOF TANK SEAL

James F. Arnold, 6440 Hillcroft, Houston, Tex. 77081

Continuation of Ser. No. 786,348, Apr. 11, 1977, abandoned. This application Feb. 14, 1979, Ser. No. 13,723

Int. Cl.³ B65D *87/18*

U.S. Cl. 277—34.3 **4 Claims**



1. A seal arrangement which, when installed, provides a sliding seal between a floating roof and the inner wall of a floating roof type tank, comprising:

a resilient seal adapted to be arranged about the periphery of the floating roof, said seal having an expansible tube portion and a lip portion, the latter having a base part attached to the tube portion and a sealing part extending from the base part outwardly and downwardly therefrom with the sealing part being spaced from the tube portion so as to be flexed about the base part toward and away from the tube portion responsive to the floating roof moving toward and away from the inner wall with the sealing part remaining in sliding sealing engagement with the inner wall;

arcuate clamp means adapted to be attached to the roof to extend along the periphery thereof to enclose the other three sides of the tube portion;

means for supplying an inflating fluid to said tube portion to cause it, when installed inside said clamp on the roof, to expand said tube and cause said one side to move outwardly toward the wall of the tank to thereby move the sealing part of the lip portion into sealing engagement with such wall, the arrangement being such that when the sealing part is so moved, it is bent inwardly from its normal unstressed position so that the resiliency of the lip maintains it in contact with the tank wall.

4,401,307

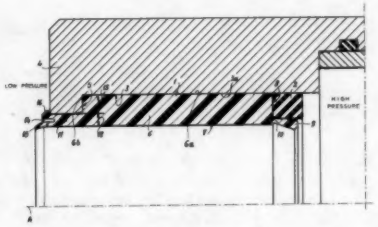
SEAL, SCRAPER, AND GUIDE FOR PISTON ROD OF SINGLE-ACTION CYLINDER

Jacques Dechavanne, 9, Chemin du Gua, Sassenage (Isere), France

Filed Sep. 10, 1981, Ser. No. 301,033

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—50 **10 Claims**



1. A seal, scraper, and guide assembly comprising:

an outer normally fixed element having a cylindrical throughgoing passage centered on an axis, extending between an axially inside high-pressure side and an axially outside low-pressure side, and having a cylindrical inner element surface formed with a shoulder facing said inside high-pressure side;

a cylindrical normally axially slidable element extending axially between said sides through said passage and having an outer element surface spaced radially inwardly of said inner element surface;

a tubular body centered in said passage on said axis and having

an outer body surface engaging radially outward against said inner element surface,

a cylindrical inner body surface engaging radially inwardly against said outer element surface, whereby said slidable element is guided in said body,

an end face engaging axially away from said high-pressure side against said shoulder,

an axially inside end lip exposed at said inside high-pressure side, having a web connecting it to said body and an end lying in the absence of said slidable element radially inward of said cylindrical inner surface, and normally bearing radially inward on said slidable element,

means including axially interengaging locking formations on said fixed element and on said body for blocking said body in said fixed element against axially inward displacement, and

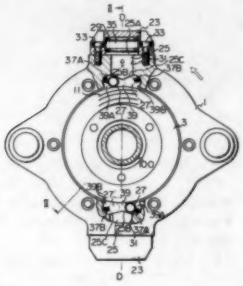
an axially outside end scraper lip exposed at said outside low-pressure side, lying in the absence of said slidable element radially inward of said cylindrical inner surface, and normally bearing radially inward on said slidable element; and

an elastomeric ring at said inner high-pressure side and engaged between said inner lip and said wall and normally elastomerically urging said inside lip inward against said slidable element.

4,401,308
SCROLL CHUCK DEVICE

Ryo Sakaguchi, and Yoshiharu Ikenaka, both of Higashi Osaka, Japan, assignors to Rex Industries Co., Ltd., Osaka, Japan

Filed May 4, 1981, Ser. No. 260,279
Claims priority, application Japan, Feb. 13, 1981, 56-18158[U]
Int. Cl.³ B23B 31/16, 31/38
U.S. Cl. 279—114 7 Claims

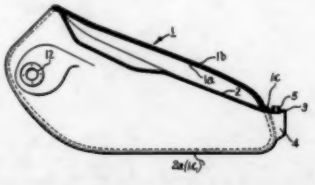


1. A scroll chuck device comprising an annular body, a ring plate which is rotatably fitted in the annular body and which has scroll grooves, jaw holders on the ring plate which have clamping jaws and which are engaged in the corresponding scroll grooves of the ring plate so that the relative rotational movement between the ring plate and the jaw holders causes the latter to radially move, and at least one clutch means between the annular body and the ring plate for transmitting the rotational movement only in one direction, said clutch means including a slide which is slidably fitted in the annular body in radial directions, a chamber provided in the annular body, and a roll pin which is arranged in the chamber and which is located on the ring plate to bear against the slide, said roll pin being movable between a clutch position in which the roll pin causes the annular body and the ring plate to rotate together and an idle position in which the roll pin is inoperative, said slide having at its inner end a rotatable element against which the roll pin always bears.

4,401,309
FUEL TANK FOR MOTORCYCLE

Kenji Matsuzaki, 888 Higashimisono, Hamakita-shi Shizuoka-ken; Akio Horino, 248 Haisaka Maisaka-cho, Hamana-gun, Shizuoka-ken; Yasuharu Terai, 80 Hatsugoshi Asaba-cho, Iwata-gun, Shizuoka-ken, and Shohei Kato, 1627-3 Yutaka-cho, Hamamatsu-shi, Shizuoka-ken, all of Japan

Filed Dec. 29, 1980, Ser. No. 221,053
Claims priority, application Japan, Dec. 28, 1979, 54-172878
Int. Cl.³ B62J 35/00
U.S. Cl. 280—5 A 8 Claims

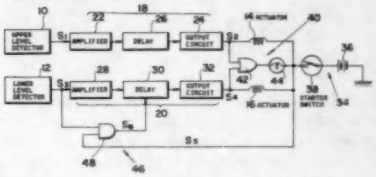


1. In a tank of the type having an outer member and an inner member, said outer and inner members being U-shaped and joined at their edges to form a closed U-shaped fuel space, the improvement comprising a rearwardly extending portion of said outer member forming a flange, a rearwardly extending portion of said inner member forming a rear stay with an uppermost flat portion, said flange extending rearwardly for a lesser distance than said rear stay, said flange and said uppermost flat portion being continuously joined together, with a part of said rear stay extending rearwardly beyond said flange.

4,401,310
VEHICLE LEVEL REGULATOR CONTROL SYSTEM

Hiroshi Ishikawa, Zama, and Sachio Satake, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Atsugi Motor Parts Company, Limited, Atsugi, both of, Japan

Filed Jul. 24, 1981, Ser. No. 286,460
Claims priority, application Japan, Sep. 27, 1980, 55-137881[U]
Int. Cl.³ B60G 17/00
U.S. Cl. 280—6.1 9 Claims



1. A control system for a vehicle level regulator comprising:
a suspension mechanism for suspending the vehicle body with respect to the wheel axle, said suspension mechanism including a suspension member for lifting the vehicle body up and down with respect to the wheel axle and having means for controlling a fluid pressure in said suspension member corresponding to the relative level of the vehicle body with respect to the wheel axle to regulate the relative level of the vehicle body with respect to the wheel axle within a predetermined range;
an actuator for controlling the operation of said fluid pressure controlling means for maintaining the vehicle level within said predetermined range;
a vehicle level detector for detecting the relative level of the vehicle body with respect to the wheel axle and producing a signal when the relative level of the vehicle body with respect to the wheel axle is out of said predetermined range;
a control circuit for transmitting said detector signal to said actuator for operating said actuator for adjustment of the vehicle level to said predetermined range, said control circuit incorporating delay means for providing a predetermined delay time between production of said detector signal and operation of the actuator; and
means for temporarily deactivating said delay means to transmit the detector signal to said actuator without delay time, said deactivating means being responsive to a predetermined vehicle condition.

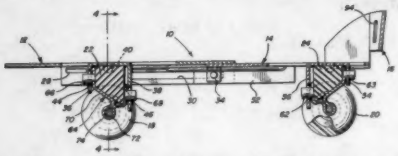
4,401,311
ROLLER SKATE

Efren M. Almeraz, 3735 Findley Ave., El Paso, Tex. 79905

Filed Mar. 10, 1981, Ser. No. 242,237
Int. Cl.³ A63C 17/24
U.S. Cl. 280—11.1 BR 2 Claims

1. In a roller skate having a base plate, front and rear axle assemblies establishing parallel spaced rotational axes, resilient mounting means for connecting the base plate to each of the axle assemblies, and a pair of roller wheels mounted on each of said axle assemblies for rotation about said rotational axes, the improvement residing in each of said mounting means including parallel spaced flanges depending from the base plate perpendicular thereto and a resilient pad in abutment with the base

plate between the flanges, each of said axle assemblies including an axle carrier and an axle rod on which one of said pairs of the roller wheels is mounted, the axle carrier having a U-shaped portion with lugs projecting therefrom parallel to the base plate into apertures formed in the flanges to accommodate limited pivotal motion of the axle carrier relative to the base plate and an axle tube integral with the U-shaped portion through which the axle rod extends, the U-shaped portion including a base inclined relative to the base plate and from which the axle tube extends, the resilient pad being enclosed by the U-shaped portion in abutment with the base thereof, each of said roller wheels including two hemispherical sections forming a spherical body having a diametral bore and a recess



in one of the sections into which the bore opens, the other of the sections of the spherical body receiving one of the axle tubes within the bore, the axle rods in said axle tubes extending therefrom through the bores into the recesses of said spherical bodies, and a bearing assembly for each of the roller wheels, comprising a bearing sleeve mounted on the axle rod within the bore associated therewith, said bearing sleeve having an external race, assembly means mounted on the axle rod and engageable with the bearing sleeve for holding thereof in axial abutment with the axle tube, an internal race embedded within the roller wheel, and ball bearing means seated within the external and internal races for rotatably supporting the wheel on the bearing sleeve in axially overlapping relation to the axle tube and the assembly means.

4,401,312

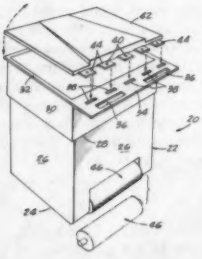
AUTOMATED TRASH COLLECTION RECEPTACLE

Bruce H. Parker, 25543 Avenida Frasca, Valencia, Calif. 91355

Continuation-in-part of Ser. No. 246,596, Mar. 23, 1981, abandoned. This application May 17, 1982, Ser. No. 378,986

Int. Cl.³ B62B *1/00, 7/02*

U.S. Cl. 280—47.17 **25 Claims**



1. Machine dumpable, self-closing trash receptacle comprising an axially elongated, upwardly open, trash receiving body having an outwardly projecting flange at its upper rim, a body cover, said body and cover being connected in hinged relation by cooperating body and cover portions defining a series of tab means and a mating series of slot means, and fastening means connecting said tab and slot means for maintaining interfitment thereof in both normal covered, and inverted dumping condition of said receptacle.

4,401,313

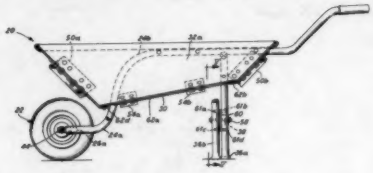
COLLAPSIBLE WHEELBARROW

Leon G. Filas, 9008 Evergreen, Wonder Lake, Ill. 60097

Filed Dec. 3, 1980, Ser. No. 212,368

Int. Cl.³ B62B *1/20*

U.S. Cl. 280—47.31 **1 Claim**



1. A collapsible wheelbarrow comprising:

a wheel assembly;

symmetrically oriented tubular members connected to one end of said wheel assembly and extending distally from said wheel assembly;

swivable mounting means for mounting said tubular elements to said wheel assembly, said swivable mounting means comprising stub shafts inserted into the ends of said tubular members;

roll pins inserted through said stub shafts and said tubular members so as to limit the swivel action of said tubular members;

a container supportably mounted on said tubular members and comprising individual bottom and side wall members;

hinge elements affixed to the underside of said bottom and side wall members removably mounting said bottom wall member to said side wall members along their respective interfacing edges;

latch means including elements releasably securing said bottom wall and side wall members to one another;

support members pivotably affixed to one another and disposed to support said tubular members at an opposite end thereof; and

means for limiting the pivoting movement of said support members.

4,401,314

RECREATIONAL TOY WHEEL VEHICLE

Thomas H. Zimmerman, Greenfield, Wis., assignor to Sandra Mae Zimmermann, Greenfield, Wis., a part interest

Filed Jan. 16, 1981, Ser. No. 225,655

Int. Cl.³ B62K *1/00*

U.S. Cl. 280—206 **8 Claims**

1. A recreational toy wheel vehicle comprising a generally annular wheel member having an outer peripheral rolling surface and a generally smooth inner peripheral surface area defining a generally circular, axially extending interior cavity, and an arcuately shaped carriage member including a seat portion and generally smooth rib means operative for making gliding contact with said generally smooth inner peripheral surface area of said wheel member and for supporting said carriage member within said interior cavity in a nonrotating

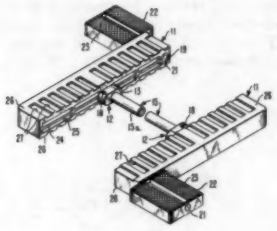
position during rotation of said wheel member on said rolling surface, said wheel member further having spaced sidewalls respectively extending from opposite lateral sides of said rolling surface, each of said sidewalls including a generally smooth inner edge radially spaced about the axis of wheel member rotation and peripherally defining a generally circular opening providing access into said interior cavity, and said carriage member further having lip means making gliding contact with each of said sidewall inner edges and operative in combination with said rib means for supporting said carriage member in said non-rotating position in said interior cavity.

4,401,315

FOOTREST FOR TWO-WHEELED ENGINE DRIVEN VEHICLES AND BICYCLES

Ivan Pavincic, 28 Glenn Ct., East Rutherford, N.J. 07073

Filed Aug. 10, 1981, Ser. No. 291,190
Int. Cl.³ B62M *5/00*
U.S. Cl. 280—259 **5 Claims**



1. A footrest device for combination power driven and pedaled vehicles comprising in combination a rotatable crankaxle adapted to extend through the vehicle; a pair of elongated members extending from the center of the crankaxle transverse to its central axis and having flat surfaces in a symmetrical disposition on opposite sides of the vehicle for seating the feet of the rider upon said flat surfaces in a parallel plane at a substantially equal distance above the ground when the vehicle is being powered by its engine and a pair of pedals rotatably secured to said elongated members at diametrically opposite ends from one another for manually rotating said crankaxle through the rotation of said members when the feet of the rider are pedaling.

4,401,316

FRONT SUSPENSION FOR MOTOCYCLE

Shinichi Miyakoshi, Fujimi, and Tokio Isono, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

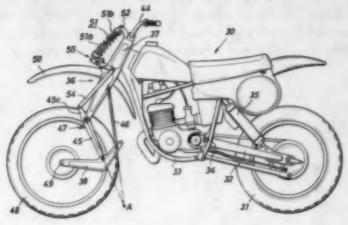
Filed Mar. 12, 1981, Ser. No. 243,054
Claims priority, application Japan, Mar. 17, 1980, 55-33752; Mar. 17, 1980, 55-33753; Mar. 19, 1980, 55-35665
Int. Cl.³ B62K *25/04*
U.S. Cl. 280—277 **14 Claims**

1. In a front suspension for a motorcycle, including: at least one first linkage in the form of a four-bar linkage having an upper fork assembly pivoted to a frame of said motorcycle and a lower fork assembly supporting a front wheel of said motorcycle, said upper fork assembly and said lower fork assembly being connected with each other through a front arm and a rear arm which are both pivotable; and at least one shock absorber which absorbs and damps movement of said front wheel in following road irregularities and causing a transformation of said first linkage; an improvement, comprising:

at least one second linkage interposed as a load transmitting passage between said first linkage and said shock absorber;

said second linkage having an input end pivotably connected to said first linkage and an output end pivotably connected to one end of said shock absorber; and

said output end being movable by a progressive displacement additional to a displacement of said input end with respect to a first direction substantially effective for said shock absorber to absorb and damp said movement of said front wheel.

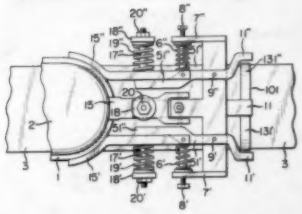


4,401,317

SKI BINDING

Yasushi Horiuchi, 11-8 Kamiyoga 3-chome, Setagaya-ku, Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 270,014
Claims priority, application Japan, Jun. 19, 1980, 55-083116
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—625 **40 Claims**



1. A heel clamp of a ski binding comprising:

at least one heel clamping arm each of which clamps the heel of a ski boot with a ski, each of said heel clamping arms having a hungover end,

a post rotatably supporting said at least one heel clamping arm, said post being fitted on the top surface of said ski,

at least one elastic member each of which urges the corresponding one of said heel clamping arms toward said heel of said ski boot with respect to said post so that each of said heel clamping arms directly clamps said heel of said ski, and

a pendulum rotatably supported by said post, said pendulum having ends each of which faces the corresponding one of said hungover ends of said heel clamping arms, remaining a small amount of clearance therebetween,

whereby said heel is clamped with said ski under a normal use of skis, but said heel is disengaged from said ski in the event that a user of said skis has fallen sideways at a slow speed.

4,401,318

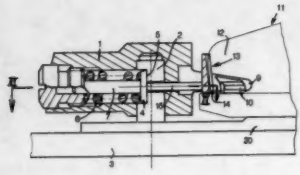
TOE ABUTMENT MEMBER FOR A SKI BINDING

Jean J. A. Beyl, Nevers, France, assignor to Ste Look, Nievre, France

Filed Sep. 2, 1980, Ser. No. 183,356
Claims priority, application France, Sep. 14, 1979, 79 22955
Int. Cl.³ A63C *9/085*
U.S. Cl. 280—630 **14 Claims**

1. A toe abutment member for a ski binding, comprising a

jaw unit constituted by two lateral arms intended to cooperate with the front portion of a ski boot in order to maintain said boot normally along the longitudinal axis of the ski, means mounting said arms for arcuate movement about a vertical axis with respect to said ski in order to permit lateral disengagement of the ski boot when an excessive twisting effort is exerted on the skier's leg, a resilient device normally maintaining said arms in a stationary boot-retaining position with a predetermined force designated as the inherent stiffness of release, a movable feeler member on said abutment member adapted to contact the front or toe portion of the boot, and means actuated upon movement of said feeler member to act upon said resilient device for reducing the inherent stiffness of release thereof whenever said feeler member is moved by the boot in response to a forward fall position of the skier and/or of an axial thrust exerted by the ski boot.



4,401,319

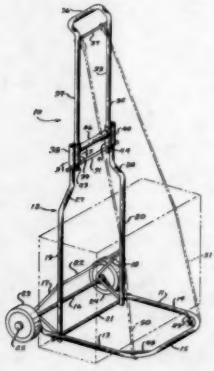
LUGGAGE CARRIER WITH PIVOTING HANDLE

Eugene A. Kazmark, 5 Remin La., Joliet, Ill. 60433

Filed Jul. 6, 1981, Ser. No. 280,942

Int. Cl.³ B62B *5/00*

U.S. Cl. 280—655 **1 Claim**



1. A luggage carrier comprising a base portion, and a handle assembly extending upwardly from the base portion, the handle assembly including a pair of spaced-apart rods attached to the base portion and extending upwardly therefrom, each of said spaced-apart rods including a laterally inwardly extending intermediate portion so that the upper ends of the spaced-apart rods are closer together than the lower ends of the spaced-apart rods, a pivot rod extending between said pair of rods adjacent the upper ends thereof and above said laterally inwardly extending intermediate portions, a generally U-shaped hand portion pivotally attached to said pivot rod, the U-shaped hand portion including a pair of side portions which extend generally parallel to and inwardly of said spaced-apart rods and which are pivotally attached to said pivot rod and a connecting portion which extends generally perpendicularly between said side portions, the hand portion being pivotable between a use position in which the side portions extend upwardly from the pivot rod and generally parallel to said pair of rods and a storage position in which the side portions extend downwardly from the pivot rod generally parallel to and inwardly of said spaced-apart rods, a first locking tube slidably mounted on each of the side portions of the U-shaped hand portion, a second locking tube secured to each of the first locking tubes, a connecting rod extending between both of said first locking tubes whereby all of the locking tubes can be raised and lowered simultaneously by moving said connecting rod, each of the second locking tubes being slidable over the upper end of one of said of pair of rods when the hand portion is in the use position whereby the hand portion is locked against pivotal movement with respect to said pair of rods, the intermediate portions of the spaced-apart rods spacing the lower ends of the spaced-apart rods a sufficient distance apart so that the locking tubes can be positioned between the spaced-apart rods when the hand portion is in the storage position.

4,401,320

DOOR FOR AUTOMOBILE

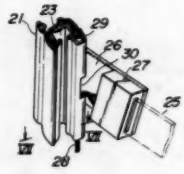
Hiroo Okuyama, and Hideoki Matsuoka, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 23, 1980, Ser. No. 199,864

Claims priority, application Japan, Oct. 25, 1979, 54-138162

Int. Cl.³ A62B *35/00*

U.S. Cl. 280—801 **3 Claims**



1. In a door for an automobile vehicle having a door frame carrying a buckle, a shoulder belt and an elastic strip adapted to receive a glass window, the improvement comprising providing said elastic strip with a channel for receiving a wire harness therein connected to said buckle and further to alarm means to signal when said shoulder belt is disconnected, in response to said alarm means.

4,401,321

PASSIVE SEATBELT SYSTEM

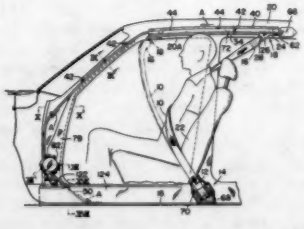
Ichiro Suzuki, Nagoya; Hisashi Ogawa, and Masanao Motonami, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 17,929, Mar. 6, 1979, abandoned. This application Apr. 8, 1981, Ser. No. 252,141

Claims priority, application Japan, Aug. 16, 1978, 53-112185

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **5 Claims**



1. A passive seatbelt system for a vehicle comprising:

a guide rail fastened to a vehicle-interior side of a roof side member of the vehicle;

a truck guided by said guide rail and which moves along said guide rail, said truck comprising a seatbelt anchor portion which extends downwardly and to which said seatbelt is fastened;

a driving system which drives said truck, said driving system comprising a driving force transmitting member for driving said truck;

a slide rail fastened to said guide rail, said slide rail comprising a groove provided on one side surface thereof opposed to said truck for restrainingly surrounding said driving force transmitting member; and

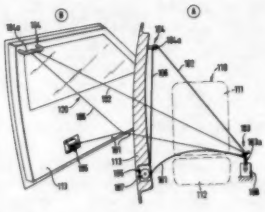
a roof lining extending over said guide rail, truck, driving system and slide rail, said roof lining being coupled to said slide rail and to a roof side of said vehicle such that a slit is formed between the roof lining and said roof side member adjacent to said guide rail through which said seatbelt anchor portion of said truck extends whereby the guide rail, truck, driving system and slide rail are provided between the roof lining and the roof side member and the guide rail, driving system and slide rail do not project into the interior of the vehicle.

4,401,322

DEVICE IN SAFETY BELTS

Eje H. K. Johansson, Backgardsgatan 32, 440 20 Vargarda, Sweden

Filed Mar. 16, 1981, Ser. No. 244,025
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—808 **9 Claims**



1. A safety belt mounted adjacent a vehicle seat for holding a user occupying said seat, said safety belt comprising a lower portion to extend over the hip portions of the user, an upper portion to extend in diagonal direction across the chest of the user from one of the hip portions to a shoulder portion, and an additional portion as a prolongation of the upper portion, the lower portion and the upper portion extending from one side of a lower portion of the vehicle seat in divergent fashion to a lower and an upper point of support respectively of a vehicle door located on the other side of the vehicle seat, the additional portion extending from the upper point of support to the lower portion of the belt, at least one return pulling means occupying a position at the lower point of support of the vehicle door, the lower portion of the belt and the additional portion of the belt being coupled to said at least one return pulling means for a return pull actuation, and lifting means for lifting up said lower belt portion upon opening the vehicle door.

4,401,323

HOLDER FOR CREDIT CARD PURCHASE FORM

Roger F. Rex, Hales Corners, Wis., assignor to DCI Marketing, Milwaukee, Wis.

Filed Jun. 5, 1981, Ser. No. 271,040
Int. Cl.³ B42F *9/00*
U.S. Cl. 281—45 **4 Claims**

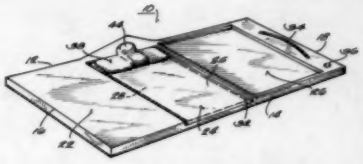
1. A device for holding a purchase form, the device comprising:

a generally planar base having a flat surface portion over which said form extends,

means for clamping one edge of said form against said surface, said means for clamping including:

a rigid clamp member including opposite edges, one of said edges being adapted to engage the edge of the form and to force it against said base member,

means for pivotally connecting the other of said edges of said clamp member to said planar base whereby said other of said edges of said clamp member will engage said base member and said clamp member will pivot on said other of said edges, said means for pivotally connecting including means defining a pair of spaced apertures formed in said planar base and a pair of projections acting as hinge members extending downwardly from said other of said edges



of said clamp member and extending through said spaced apertures, said projections including means for engaging an edge of said apertures and for preventing removal of said projections from said apertures,

a lever member fixedly joined to said other of said edges of said clamp member, said lever member including an end being movable toward the planar base to cause pivotal movement of said clamp member and movement of said one edge away from said base, and

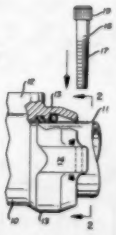
means for biasing said lever member away from said base and for thereby biasing said one edge into clamping engagement with said base member, said means for biasing including a compression spring having opposite ends, one of said ends engaging said lever member, and an opposite end being supported by said base.

4,401,324

PIPE COUPLING WITH A LOCKING DEVICE

Ray M. Rumble, Canfield, Ohio, assignor to Michigan Pipe Fittings Co. Div. of Michigan Hanger Co., Hubbard, Ohio

Filed Feb. 19, 1981, Ser. No. 236,731
Int. Cl.³ F16L *21/08*
U.S. Cl. 285—90 **5 Claims**



1. An improvement in a separable coupling for joining together a pair of pipes and having a cylindrical body with a pair of open ends, each for receiving one of said pair of pipes and means inwardly of said open ends for engaging said pipes and acting to hold said pipes in said coupling, sealing means in said coupling inwardly of said engaging means and longitudinally projecting offset bosses on each end of said coupling extending beyond said open ends in positions spaced with respect to the outer surfaces of said pipes positioned in said coupling; the

improvement comprising rotatable elongated members positioned crosswise of and alongside said outer surfaces of said pipes beyond said open ends and between said projecting offset bosses and said outer surfaces of said pipes for wedging engagement therebetween.

4,401,325

FLEXIBLE PIPE COUPLING

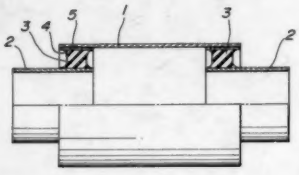
Kazuo Tsuchiya; Hirotsugu Masuda, both of Yokohama, and Yuji Sakaguchi, Tokyo, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1981, Ser. No. 251,842

Claims priority, application Japan, Apr. 28, 1980, 55-58449[U]

Int. Cl.³ F16L *27/ 10*

U.S. Cl. 285—231 **3 Claims**



1. A flexible pipe coupling comprising; a large diameter cylindrical hollow body, a pair of small diameter cylindrical hollow bodies each having one end portion disposed inside each end of said large diameter cylindrical hollow body on the same axial line, and means connecting each end of said large diameter cylindrical hollow body to one end of each of said small diameter cylindrical hollow bodies, said means including an elastic sleeve member positioned substantially at each end of said large diameter cylindrical hollow body, each of said elastic sleeve members having two ends and a radial thickness and being provided at its both ends adjacent to said large and small diameter cylindrical hollow bodies with protrusions each extending axially outwardly from said ends in the widthwise direction of said sleeve member at a radius of curvature corresponding to 0.1～0.4 times the radial thickness of said sleeve member, and said sleeve member having a straight portion between said protrusions corresponding to 0.2～0.8 of its radial thickness.

4,401,326

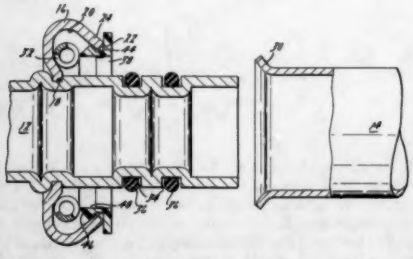
QUICK-CONNECT TUBULAR COUPLING

Mark A. Blair, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1981, Ser. No. 331,111

Int. Cl.³ F16L *39/00, 55/00*

U.S. Cl. 285—318 **6 Claims**



1. A coupling for joining a first tube and a second tube having a radially outward flared end adapted to fit over the end of the first tube comprising:

a cage forming a chamber mounted against axial displacement on the outer surface of the first tube near one end thereof having an aperture facing the first tube end;

a snap ring adapted for resilient retention on the periphery of the cage aperture having a surface located within the cage before the tubes are joned; and

a radially expandable spring means located within the chamber of the cage around the outer surface of the first tube end, adapted to expand radially over the flared end and to become located between the outer surface of the flared end of the second tube and the inner surface of the cage thereby preventing axial withdrawl of the second tube from the first tube and to contact the snap ring surface thereby forcing the snap ring out of retention on the cage aperture upon moving past the flared end.

4,401,327

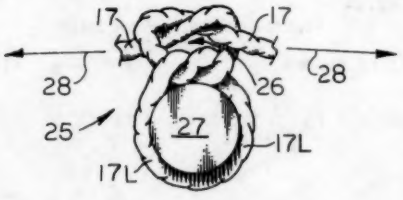
NYLON TWINE AND THE LIKE HAVING AMELIORATED KNOT STRENGTH

R. Scott Caines, 108 Ashmore Rd., Greer, S.C. 29651

Continuation-in-part of Ser. No. 272,779, Jun. 11, 1981, abandoned. This application Mar. 23, 1982, Ser. No. 361,525

Int. Cl.³ D04G *5/00*; B05D *1/18, 3/02*

U.S. Cl. 289—1.2 **30 Claims**



11. An artificially-conditioned, treated nylon twine and the like or equivalent filamentary product,

said twine product being characterizable as having extraordinary power and capability as compared with identically dimensioned raw nylon twine to be reliably tied into strong, durable and slip-resisting knot formations having features of secure dependability with at least substantially, if not completely, eliminated propensities to slitheringly loosen and become mechanically broken and de-interlacingly unfastened upon subjection to pulling-apart stress and/or strain force,

said beneficiated twine comprising:

(i). a basic nylon twine body structure; upon and externally about which there is

(ii). a circumenveloping thin-skin film layer of tightly-adhering superstrate deposit formation of carboxylated diene-monomer interpolymerizate synthetic resinous material.

12. A beneficiated treated nylon twine and the like product which is in accordance with that of claim **11**, wherein:

said superstrate layer (ii) is the dried residue of a pre-applied latex preparation of the said carboxylated diene-monomer interpolymerizate.

13. A beneficiated treated nylon twine and the like product which is in accordance with that of claim **11**, wherein

the carboxylated diene-monomer synthetic resinous material in said superstrate layer (ii) is an interpolymerizate of:

at least about 0.5 wt. % of interpolymerized diene monomer of the Formula (I); and

not more than about 25 wt. % of interpolymerized acid-containing monomer of the Formula (III).

14. A beneficiated treated nylon twine and the like product which is in accordance with that of claim **11**, wherein

the carboxylated diene-monomer synthetic resinous material in said superstrate layer (ii) is an interpolymerizate of:

at least about 1 wt. % of interpolymerized diene monomer of the Formula (I);

between about 30 and about 98.5 wt. % of interpolymerized alkenyl aromatic monomer of the Formula (II); with

an interpolymerized balance of not more than about 10 wt. % of converted and molecularly-combined Formula (III) acid-containing monomer constituents.

15. A beneficiated treated nylon twine and the like product which is in accordance with that of claim **11**, wherein

the carboxylated diene-monomer synthetic resinous material in said superstrate layer (ii) is an interpolymerizate of:

between about 25 and about 60 wt. % of interpolymerized diene monomer of the Formula (I);

between about 40 and about 75 wt. % of interpolymerized alkenyl aromatic monomer of the Formula (II); with

from about 1 to about 5 wt. % in the interpolymerizate of converted and molecularly-combined Formula (III) acid-containing monomer constituents.

4,401,328

ELECTRICALLY OPERATED FISHLINE TIER

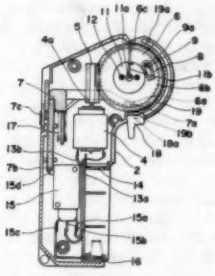
Kenichi Yamada, Katano; Seiji Yokogawa; Shigehiko Fujita, both of Hirakata; Kiyoshi Takenaka, Fujiidera, and Koichi Tanoue, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 20, 1982, Ser. No. 341,150

Claims priority, application Japan, Jan. 26, 1981, 56-10664; Jan. 26, 1981, 56-10666; Jan. 26, 1981, 56-10667; Apr. 14, 1981, 56-54168[U]; Jul. 9, 1981, 56-108083

Int. Cl.³ A01D *59/04*

U.S. Cl. 289—2 **11 Claims**



1. An electrically operated, hand-held tier for securing a fishhook to a length of fishline, which comprises, in combination:

a generally elongated, flattened housing having a bearing boss and a first guide slit means defined therein, said first guide slit means extending exteriorly of the housing and terminating at a position spaced the minimum possible distance from the longitudinal axis of the bearing boss;

a drive motor housed in the housing;

a tying wheel rotatably mounted on the bearing boss with a portion thereof exposed to the outside of the housing, said tying wheel having one annular end face formed with an annular projection protruding therefrom in coaxial relation thereto and also having a second guide slit means defined therein, said second guide slit means extending in a radial direction completely across the tying wheel, said annular projection having a detent recess defined therein;

a transmission means housed in the housing for transmitting a drive of the motor to the tying wheel to rotate the tying wheel in one predetermined direction;

an anchoring member rigidly mounted on the other annular end face of the tying wheel for rotation together therewith, said anchoring member being adapted to releaseably hold a free end portion of the length of fishline once it has been connected thereto; means secured to the bearing boss on one side laterally of said other annular end face of the tying wheel for releaseably supporting one end of the fishhook, opposite to its sharp point, in coaxial relation to the longitudinal axis of the bearing boss;

a manipulatable switching lever supported in the housing for movement between operative and inoperative positions and having a pawl element formed therein, said pawl element being, when and so long as the switching lever is in the inoperative position, engaged in the detent recess to hold the tying wheel at a stop position whereat the second guide slit means is registered with the first guide slit means in side-by-side relation to permit the passage of a portion of the fishline through both of the first and second guide slit means in a direction radially inwardly of the tying wheel so as to traverse from one side of the tying wheel to the other side thereof across and generally coaxially of the bearing boss, said anchoring member being exposed to the outside of the housing when and so long as the tying wheel is held in the stop position;

a power supply control switch operatively associated with the switching lever for, when turned on in response to the movement of the switching lever from the inoperative position to the operative position with the pawl element consequently disengaged from the detent recess, completing a power supply circuit from a source of electrical power to the drive motor to energize the latter, said switch being turned off in response to the return movement of the switching lever towards the inoperative position; and

a biasing means for urging the switching lever to the inoperative position.

4,401,329

MACHINE FOR AUTOMATICALLY TYING KNOTS IN MEAT STUFFED IN A CASING BY MEANS OF A STRING

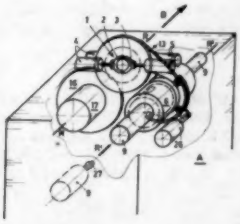
Luigi Pedroia, Via Cadogno 1, 6648 Minusio, Switzerland

Filed May 1, 1981, Ser. No. 259,502

Claims priority, application Switzerland, May 8, 1980, 3586/80

Int. Cl.³ A22C *11/12*; B65H *69/04*

U.S. Cl. 289—18.1 **5 Claims**



1. A machine for automatically tying knots in meat stuffied in a casing by means of a string, comprising means to squeeze the casing over a given stretch in order to remove the sausage therefrom prior to tying, a spool assembly comprising a spool carrying a supply of string, a housing for said spool which is movable parallel to the axis of feed of the casing, a rotatably mounted mechanism having an opening for the passage of the casing on its way to being tied and a hook-shaped portion for the passage of the spool assembly therethrough, aid mechanism having memebers for temporarily supporting a length of string over a polygonal path, and an axially moving element for detaching said length of string from said supporting members, in which the knot is tied by movement of the spool to various positions, namely:

a final position (E) of the spool assembly upstream of said mechanism which rotates in order to form the polygon of string;

a position (F) of the spool assembly downstream of said mechanism to allow the latter to make a first rotative and tying motion;

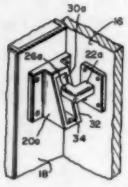
a position (G) rotated angularly and downwardly from position (F) to allow said mechanism to unwind, through a rotative motion, the length of string required for the tying, followed by its return to the previous position (F), finally assuming its final position (E) downstream of said mechanism in order to achieve a second tying stage, comprised by pulling the string so as to form the knot.

4,401,330

MEANS FOR, AND A METHOD OF, SECURING A CLOSURE

John R. Foster, Indianapolis, and James E. Placke, New Palestine, both of Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed May 13, 1981, Ser. No. 263,109
Int. Cl.³ E05C *15/00*
U.S. Cl. 292—300 **11 Claims**



1. A method of securing a closure, such as a door or the like, in closed interface with an elongate element, such as a mullion, a frame member, or the like, in response to a thermal distortion of such element, comprising:

fixing one end of the element to an immobile bearing surface;

securing the element against angular movement thereof relative to such fixed one end;

exposing the other end of the element to a free space; and

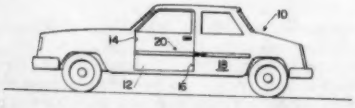
mounting to the element and to the door separate locking components which lockingly engage only upon (a) the closure being in closed interface with the element, and (b) at least the element manifesting thermal distortion.

4,401,331

AUTOMOBILE DOOR GUARD

Edward H. Ziner, 5001 Windom Rd., Bladensburg, and Adam A. Moroski, 6422 Kilmer St., Cheverly, both of Md. 20710

Filed Nov. 5, 1980, Ser. No. 204,332
Int. Cl.³ B60R *13/04*
U.S. Cl. 293—128 **16 Claims**



1. An automobile door guard comprising:

(a) a linearly extending guard section having a first outer hollow part and a second inner part in telescopic engagement therewithin

(b) a clip on each said part, each clip including a first portion extending in spaced relation to said part, a second portion extending into said part parallel to said first portion, and connecting means extending transversely between said first and second portions,

(c) resilient means for urging said parts together connected to said second portion, and

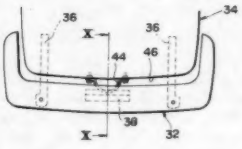
(d) means for locking said parts in any one of a plurality of positions.

4,401,332

BUMPER CONSTRUCTION FOR AUTOMOTIVE VEHICLES

Toshimitsu Kimura, Fujisawa, and Yutaka Ohmura, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 21, 1981, Ser. No. 226,954
Claims priority, application Japan, Jan. 31, 1980, 55-9290
Int. Cl.³ B60R *19/06*
U.S. Cl. 293—135 **18 Claims**



1. A bumper construction for an automotive vehicle which has a pair of spaced-apart bumper mounting stays fixed to the vehicle body, the bumper construction comprising:

a resilient, non-metallic bumper extending across an end of the vehicle, said bumper being mounted to the bumper mounting stays, said bumper having a C-shaped cross section including upper and lower bumper wall sections;

a reinforcement member mounted on said bumper at the approximate longitudinal center point section of said bumper between said bumper mounting stays, said reinforcement member interconnecting said upper and lower wall sections of said bumper thereby forming an approximate rectangle when viewed in cross section; and

a spring member interposed between and operably connecting said reinforcement member and the vehicle body such that said longitudinal center point section of said bumper is mounted to the vehicle body, said spring member resiliently deforming and yieldingly resisting horizontal movement of said longitudinal center point section of said bumper towards the vehicle body, said spring member remaining substantially rigid and unyieldingly preventing substantial vertical movement of said longitudinal center point section of said bumper.

4,401,333

PELICAN HOOK

Carl A. Merry, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.

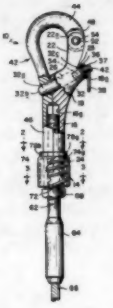
Filed Aug. 31, 1981, Ser. No. 297,914
Int. Cl.³ B66C *1/36*; F16B *45/04*
U.S. Cl. 294—83 R **3 Claims**

1. In a pelican hook of the type having an elongated rigid main body, a rigid hook-shaped arm having a curved end segment and a relatively straight end segment, a pivot pivotally connecting the free end of the curved arm segment to one end of the main body so that the arm can swing between an open position wherein the straight arm segment is positioned away from the main body and a closed position wherein the straight arm segment lies flush against the main body thereby defining a closed loop at the end of the hook, a retractable spring-loaded locking pin extending obliquely through the main body, and a passage in the arm which, when the arm is in its closed position, is aligned with the pin so that the pin is biased into the passage so as to lock the arm in its closed position characterized in that

A. a locking sleeve encircles the opposite end of the main body and is slidable therealong;

B. stop means are provided on the main body for establishing a reference position for the sleeve relative to the main body at which the sleeve engages around the free end of the straight arm segment when the arm is in its closed position;

C. means are provided for biasing the locking sleeve toward its reference position, said sleeve being retractable along the main body in opposition to the biasing means beyond the free end of the straight arm segment, said biasing means comprising



(1) a nut threadedly engaged on the stud adjacent said opposite end of the main body, said nut having a smaller diameter than the inside diameter of the sleeve; and

(2) a coil spring encircling the main body opposite end inside the sleeve, said spring being compressed between the nut and a portion of the sleeve;

D. said locking pin and said locking sleeve have to be retracted simultaneously in different directions in order to release the arm so that the arm can swing to its open position, and

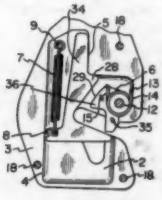
E. an elongated rigid stud is threadedly engaged in the main body.

4,401,334

AUTOMATIC CARGO HOOK

John B. Kraeling, Jr., 4210 Roxbury Rd., Erie, Pa. 16506

Filed Aug. 3, 1981, Ser. No. 290,779
Int. Cl.³ B66C 1/38
U.S. Cl. 294—83 R **20 Claims**



1. A self-releasing hook comprising:

hook body, ejection plunger, latch and biasing means operatively arranged to receive an unloaded load ring or the like and to hold the ring until after loading and to eject the ring when unloaded again;

said hook body comprising an elongate portion having near one end an opening for receiving a shackle pin or the like and at the other end a slot to receive a load ring and a crotch defining a seat for supporting the load ring, said hook body having an extension from the seat to prevent a seated load ring from sliding out of the crotch;

said latch comprising a bell crank-like shape pivotally mounted to the hook body for restricted rotation relative thereto, said latch having a first normally transverse arm and a second perpendicularly extending arm, said second arm having a normal position blocking access to the hook slot, said latch arranged to permit the second arm to rotate inward toward the transverse position but not outwardly from said normal blocking position, one side of said first arm defining a cam follower surface;

means for biasing the latch in the normal blocking position;

said plunger slidably engaging the hook body and having a bearing surface against which the load ring bears when inserted in the seat and an extending pawl arm arranged to ride over the cam follower surface on said latch upon the downward mo /ement thereof and to move into a first arm engaging position upon downward movement of the plunger; and

means for biasing the plunger upwardly

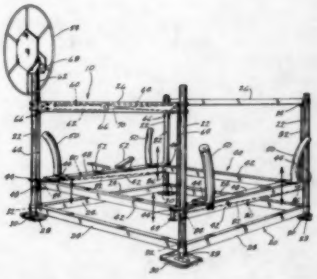
whereby a load ring or the like may be inserted past the latch into the slot of the hook body to rest upon the bearing surface of the plunger and then the ring cannot be withdrawn back past the latch and whereby as the load is applied to the load ring it pulls downward to the seat of the hook body carring the plunger with it and whereby when the load is removed the bearing surface of the plunger carries the load ring out of the crotch and at the same time, the pawl arm thereof kicks the latch out of the blocking position permitting the load ring to escape the hook.

4,401,335

BOAT HOIST

Byron L. Godbersen, 710 Circle Dr., Ida Grove, Iowa 51445

Filed May 29, 1981, Ser. No. 268,359
Int. Cl.³ B25J 7/00
U.S. Cl. 294—84 **11 Claims**



1. A boat hoist, comprising:

a vertical frame;

a horizontally disposed platform attached to said frame, said platform being movable in a vertical direction between a lowered position and a raised position;

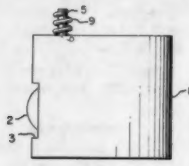
means for exerting an upwardly directed force at a first point on said movable platform; and

means for transmitting said upwardly directed force to a second point on said movable platform remote from said first point, wherein said upwardly directed force is evenly distributed between said first point and said second remote point, to raise the platform in a level manner.

4,401,336
HOLLOW CORE HOLDER

Douglas A. Matthews, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 17, 1981, Ser. No. 235,037
Int. Cl.³ B66C 1/54
U.S. Cl. 294—94 4 Claims



1. A device for insertion into and handling of a hollow core comprising:

(i) a hollow cylinder with at least one slot therein;

(ii) at least one cam eccentrically rotatably mounted inside said cylinder to protrude from the cylinder through the slot in one rotation status and to be wholly within the cylinder in another rotation status;

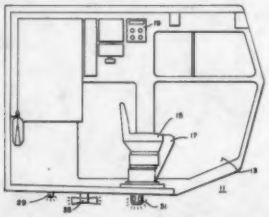
(iii) a rod for rotating the cam extending out of one end of the cylinder and attached to the cam such that, when the protruding edge of the cam is flush with the outside surface of the cylinder, the rod is attached to the cam such that the longitudinal axis of the rod is further away from the slot than is a line drawn through the point at which the cam is mounted parallel with the axis of the rod;

(iv) biasing means to urge the rod to pull the cam and, thereby, to urge the cam to protrude from the cylinder through the slot.

4,401,337
INTERLOCK SYSTEM FOR THE LOCKING MECHANISM OF A CARGO CONTAINER LIFTING SPREADER

Donald E. Simmons, Emeryville; Raymond H. Barker, Jr., Walnut Creek, and Kenneth D. Walter, Foster City, all of Calif., assignors to Rigging International Maintenance Co., Oakland, Calif.

Filed Nov. 6, 1978, Ser. No. 958,016
Int. Cl.³ B66C 1/42
U.S. Cl. 294—81 SF 10 Claims



1. In a cargo container lifting apparatus employing a lifting spreader which contacts the top of cargo containers for lifting same and which has locking mechanisms for lockingly engaging corresponding locking parts disposed on the top of said cargo container for locking said spreader into contact therewith, and having an interlock system for interlocking the manual control switch which actuates said lifting spreader locking mechanisms so as to prevent premature operator initiated actuation thereof, said electrical interlock system including proximity switching means associated with each of the locking mechanisms of said lifting spreader, and each of said proximity switching means having means for sensing the proximity between said cargo container and said lifting spreader in the area of its associated locking mechanism, the improvement wherein

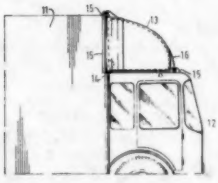
all of said proximity switching mean are interconnected in parallel relation and are normally closed whereby an energizing current is allowed to flow therethrough until all of the proximity switching means of the utilized locking mechanisms of the lifting spreader are actuated to an open condition by the proper contact of the lifting spreader with the top of a cargo container whereupon the flow of said energizing current is prevented, and wherein

relay switching means are provided having an energizing circuit and a relay circuit means, said energizing circuit being connected in series with said parallel connected proximity switching means whereby the energizing current controlled by said proximity switching means is permitted to flow therethrough, said relay circuit means being operatively connected for controlling the availability of power to said control switch and being in a normally closed condition in respect to said energizing circuit whereby said control switch is operative until said proximity switching means are actuated to an open condition by suitable contact between said lifting spreader and the top of a cargo container.

4,401,338
STREAMLINING DEVICE FOR VEHICLES

Kenneth Caldwell, Bridport, England, assignor to Fibrelock Fabrics Limited, England

Filed Nov. 14, 1980, Ser. No. 207,186
Claims priority, application United Kingdom, Nov. 16, 1979, 79/39672
Int. Cl.³ B62D 35/00
U.S. Cl. 296—1 S 9 Claims



1. A streamlining device for improving aerodynamic characteristics of land vehicles comprising a preshaped flexible outer sheath adapted to be secured to the vehicle, said sheath including a contiguous skirt portion, said skirt portion being affixed to the sheath along an edge thereof, anchoring means including at least one track member mounted to said vehicle with an opposite edge of said skirt portion being secured to said anchoring means, at least one inflatable sack member underlying said sheath, valve means for introducing a substance for expanding the sack and for concurrently extending the outer sheath to a predetermined bulbous shape.

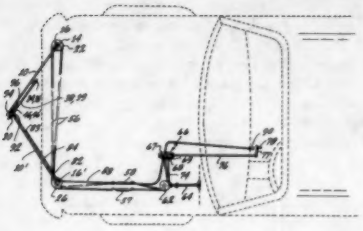
4,401,339
AIR DEFLECTOR FOR VEHICLES

Roberto Rios, 533 E. 182nd St., Carson, Calif. 90746

Filed Dec. 15, 1980, Ser. No. 216,375
Int. Cl.³ B62D 35/00
U.S. Cl. 296—1 S 7 Claims

1. A drag reducing apparatus for use with vehicles comprising in combination, deflector means including panels constructed to be positioned to form a v-shaped wind deflector extending forwardly of the vehicle, said panels being constructed to be collapsible into a parallel position with one panel forwardly of the other, means mounting the panels to be extendable forwardly of the vehicle including vertical mounting posts and operating means for the panels operable from within

the vehicle including linkage mechanism connected to the panels whereby the panels may be retracted into a collapsed position from within the vehicle, the panels in the collapsed position being in a substantially flat parallel partly overlapping



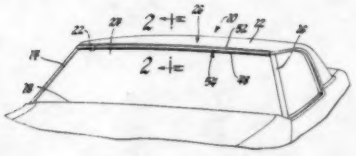
relationship, guide means on the inside of each of the panels, the guide means on the panels being constructed whereby the panels can be rotated outwardly simultaneously into a v-shaped configuration in fully extended position.

4,401,340

WINDOW REVEAL MOLDING

John H. Ankrapp, Bloomfield Hills; Donald J. Holzen, Mt. Clemens, and Donald F. Rinke, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1981, Ser. No. 326,856
Int. Cl.³ B60J *1/02*
U.S. Cl. 296—93 **2 Claims**



1. In a motor vehicle having an opening defined therein by a peripheral flange of a body panel and closed by a window panel mounted below the general plane of the body panel with a space between the peripheral edge of the window panel and the body panel flange, a molding for concealing the space and streamlining the transition from the window panel to the body panel, comprising,

an elongated body portion adapted to be received within the space between the window panel edge and body panel flange with a first side of the body portion respective the peripheral edge of the window panel and a second side of the body portion respective the body panel flange,

the body portion further including a leg extending laterally from the first side thereof over the window panel edge and terminating in a retroflex lip sloping from the window panel toward the body panel,

the body portion further including a leg extending from the second side thereof along the body panel flange and terminating in a retroflex lip overlying the body panel,

an elongated strip of generally C-shaped cross-section having a pair of return bent side walls and a decorative outer wall substantially coplanar with the body panel,

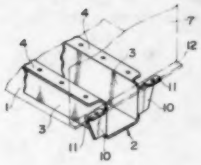
and means on the body portion receivable within the return bent side walls to mount the elongated strip to the body portion with one of the return bent side walls bearing against the first leg to maintain its retroflex lip in contact with the window panel and with the other return bent side wall in contact with the second leg to maintain it in contact with the body panel flange and to maintain its retroflex lip in contact with the body panel, the sloping retroflex lip of the first leg, the decorative outer wall and the retroflex lip of the second leg forming a streamlined transition from the window panel to the body panel.

4,401,341

PANEL REINFORCEMENT STRUCTURE CONSTRUCTION

Hirokazu Hirabayashi, Tokyo; Hirotaka Tomioka, and Shuji Yamagata, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 10, 1981, Ser. No. 242,278
Claims priority, application Japan, Mar. 17, 1980, 55-32625
Int. Cl.³ B62D *25/02*
U.S. Cl. 296—185 **3 Claims**



1. A panel reinforcement structure construction for a vehicle comprising:

a vehicle structural panel;

an elongate channel member having two side sections and a bottom section, said side sections and said bottom section cooperating to define a channel, each of said side sections having a first attachment flange attached to and extending transversely from the upper free edge of said side section, said first attachment flange being fixed to said vehicle structural panel,

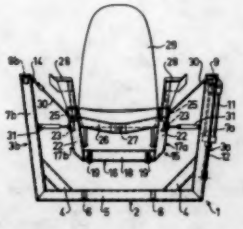
said elongate channel member having two arm sections, each attached to and extending transversely from the end of each of said side sections, each of said arm sections having a second attachment flange attached to and extending transversely from the upper free edge of said arm section, said second attachment flange being fixed to said vehicle structural panel.

4,401,342

DEVICE FOR ELIMINATING VIBRATIONS OF A DRIVER'S CHAIR

Karl-Gunnar Andersson, Postlada 200, S-956 00 Överkalix, Sweden

Filed Oct. 27, 1981, Ser. No. 315,426
Claims priority, application Sweden, Nov. 3, 1980, 8007701
Int. Cl.³ B60R *21/10*
U.S. Cl. 297—216 **7 Claims**



1. A device for eliminating vibrations of a driver's chair, comprising a carrying frame, a cradle provided in the carrying frame and carrying the driver's chair, the cradle including a plurality of rotatably mounted pulleys and being supported

relative to the carrying frame such that the pulleys contact at least two wires or ropes supported by the carrying frame, one end of said wires being secured resiliently in the carrying frame, the wires extending transversely to the driving direction of the vehicle in which the device is adapted to be mounted such that inclinations at least in the transverse direction may be compensated, and damping means extending between the carrying frame and a portion of the cradle near a central portion of the driver's chair.

4,401,343

UPHOLSTERED SEAT FOR MOTOR VEHICLE

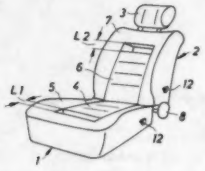
Hans T. Schmidt, Bad Friedrichshall, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 18, 1981, Ser. No. 235,686

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008179

Int. Cl.³ A47C *3/00*

U.S. Cl. 297—284 **3 Claims**



1. An upholstered seat for a motor vehicle, comprising a seat member and a backrest, at least one of which includes a support area with a central part, a U-shaped edge part at least partly surrounding said center part and adapted to provide lateral support, and means for adjusting said edge part in a lengthwise direction in relation to the respective central part to change the size of said support area.

4,401,344

AUTOMOBILE SEAT BACK RECLINING MECHANISM

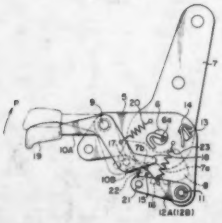
Takeshi Chihara, and Hiroyuki Gokimoto, both of Hiroshima, Japan, assignors to Delta Kogyo Co. Ltd. and Toyo Kogyo Co., Ltd., both of Hiroshima, Japan

Filed Oct. 5, 1981, Ser. No. 308,654

Claims priority, application Japan, Oct. 6, 1980, 55-140052; Oct. 7, 1980, 55-143740[U]

Int. Cl.³ A47C *1/026*

U.S. Cl. 297—367 **5 Claims**



1. A seat back reclining mechanism for an automobile seat having a seat bottom and a seat back, said mechanism including a stationary bracket attached to the seat bottom, a movable bracket attached to the seat back and connected with said stationary bracket for pivotable movement about a pivot axis, said movable bracket having a plurality of indentations formed along an arc having a center on said pivot axis, first locking lever means pivotably mounted on said stationary bracket, said first locking lever means having an actuating part provided at one end and first locking pin means provided at the other end for selective engagement with one of the indentations on the movable bracket, second locking lever means pivotably mounted on said stationary bracket having second locking pin means for selective engagement with one of the indentations on the movable bracket, said first and second locking lever means being oriented so that they extend substantially tangentially with respect to the arc on the movable bracket when the respective locking pin means are engaged with the indentations, said first and second locking pin means being located with each other so that they alternately brought into engagement with said indentations, interconnecting means for transmitting a pivotable movement of the first locking lever means to the second locking lever means so that an adjustment of a seat back inclination can be carried out by actuating the first locking lever means.

4,401,345

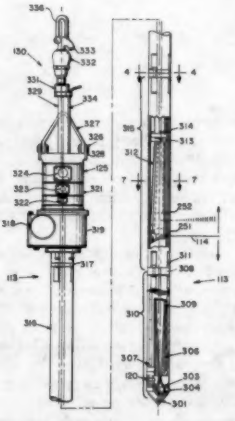
HYDRAULIC BOREHOLE MINING SYSTEM

William R. Archibald, King County, Wash., assignor to Flow Industries, Inc., Kent, Wash.

Continuation of Ser. No. 145,573, Apr. 30, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,607

Int. Cl.³ E21C *45/00*

U.S. Cl. 299—64 **8 Claims**



1. A bore hole mining tool, comprising:

a slurry removal section;

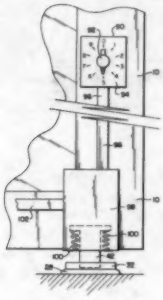
a jet cutting section connected to said slurry removal sections means including an elongated tubular member, having a vertical slot therein and means glidably mounting said jet cutting means within said vertical slot for axial movement of said jet cutting means relative to said slurry removal section;

means for moving said jet cutting means independently of said slurry removal section in a vertical directions, whereby said jet cutting means may be selectively positioned relative to said slurry removal section.

4,401,346
APPARATUS FOR CONTROLLING THE OPERATION OF A DOOR

Jack D. Jones, Lima, Ohio, and Russell K. Glover, Jr., Tequesta, Fla., assignors to Aircraft Dynamics Corporation, Elida, Ohio

Filed Mar. 19, 1981, Ser. No. 245,311
Int. Cl.[3] E05B 47/00
U.S. Cl. 292—144 6 Claims



1. Apparatus for controlling the operation of a door, said apparatus comprising:

a door mounted in a door frame in a vertical plane, said door having two vertically extending sides and being pivotable about one of its vertical sides between open and closed positions,

mechanical means for biasing said door toward a closed position,

a body of ferromagnetic material on one of said door and a portion of a building adjacent said door

an electromagnet mounted on the other of said door and said portion of said building;

means for supplying electric power to said electromagnet;

means for timing a predetermined interval;

means for actuating said timing means to begin the timing of said predetermined interval, and

means electrically connecting the power supply means with the timing means,

said power supply means commencing the supply of electric power to said electromagnet upon actuation of said timing means and interrupting said supply of electric power to said electromagnet when said predetermined interval has elapsed, thereby permitting said biasing means to close said door,

said body of ferromagnetic material including a planar surface facing toward said electromagnet when said door is in its open position, a detent projecting perpendicularly outward of said planar surface,

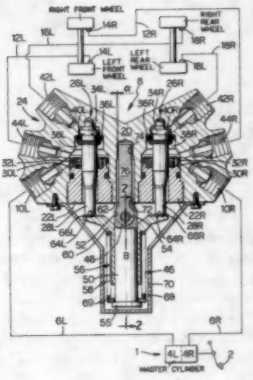
said electromagnet and detent combining to overlap vertically when the door is open and when the timing means has been actuated, said detent abutting the electromagnet and being located in the path of the electromagnet as it is urged toward closed position by said mechanical biasing means, whereby the door cannot close because of the abutting relationship during the predetermined interval,

one of said detent and electromagnet being vertically movable into the path of the other with said movement to abutment position being solely due to the power supplied to the electromagnet.

4,401,347
FLUID PRESSURE CONTROL VALVE FOR DUAL BRAKING SYSTEM

Hiroshi Kawaguchi, Mishima, and Shuho Nishina, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 15, 1981, Ser. No. 273,493
Claims priority, application Japan, Dec. 9, 1980, 55-176561[U]; Dec. 27, 1980, 55-191230[U]
Int. Cl.[3] B60T 11/28
U.S. Cl. 303—6 C 15 Claims

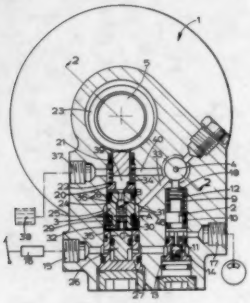


1. A braking fluid pressure control apparatus, including (1) a pair of valve plungers disposed in parallel in one housing with rear ends thereof protruding out of said housing, and (2) means for biasing the rear ends into said housing, for controlling the braking fluid pressure produced in a master cylinder to be transmitted to each wheel brake disposed on a left rear wheel and a right rear wheel of a vehicle via two independent piping circuits, said biasing means comprises (a) a guide rod retained at a middle position between said pair of valve plungers by a pivot pin oscillatably in a pivot plane parallel to a plane including the axes of both plungers, (b) a transmitting member provided with a tubular portion slidably fitted on said guide rod and an operating portion abuttable on the rear ends of said valve plungers, said tubular portion engaging said guide rod over a distance sufficient for preventing movements of said transmitting member relative to said guide rod other than sliding of the former along the latter and rotation of the former about the latter, (c) a spring for constantly imparting a predetermined biasing force to the rear ends of said valve plungers, and (d) stopping means for limiting oscillation of said guide rod in said pivot plane to within a predetermined angular range as measured from a straight line passing through the axis of said pivot pin and parallel to the axes of said valve plungers, and when pressure failure occurs in one of said independent piping circuits one of said valve plungers corresponding to a normal circuit executes pressure controlling operation thereof while singly resisting the biasing force of said spring for slidably moving said transmitting member along said guide rod whose oscillation is stopped at one end of said angular range by said stopping means.

4,401,348
HYDRAULIC ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 11, 1981, Ser. No. 233,333
Claims priority, application United Kingdom, Feb. 16, 1980, 8005304
Int. Cl.³ B60T *8/02*
U.S. Cl. 303—116 **23 Claims**



1. An hydraulic anti-skid braking system for a vehicle having a wheel, comprising a brake for braking the wheel, a supply of brake-operating fluid for applying said brake, skid sensing means for said wheel for producing skid signals, a modulator assembly for modulating said brake-operating fluid from said supply to said brake in accordance with said skid signals, an hydraulic pump of the double-acting type, said hydraulic pump having a piston assembly comprising relatively movable plunger parts, and having a working chamber which is in communication with said modulator assembly to control brake re-application following skid correction, a drive mechanism for said pump, a reservoir for hydraulic fluid, a dump valve for controlling fluid in said working chamber to which said piston assembly is exposed at least after said brake has been applied, said dump valve being normally closed to hold said piston assembly in a retracted position in which said piston assembly is disengaged from said drive mechanism, and said dump valve being movable in response to said skid signal to release fluid from said working chamber to render said drive mechanism operative, fluid-pressure biassing means operative in conjunction with said drive mechanism to cause relative movements of said plunger parts in a pump cycle to draw fluid from said reservoir in an induction stroke and to deliver fluid to said working chamber in a delivery stroke to pressurise same following said skid correction, whereby to re-apply said brake, and valve means operative in conjunction with said biassing means and said drive mechanism to provide at least two delivery strokes during each said pump cycle.

4,401,349
BEARING ASSEMBLIES FOR SPINDLES

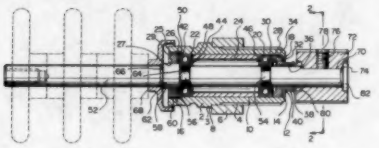
James S. Campbell, Kingston, Canada, assignor to Spintex, Inc., New York, N.Y.

Filed Oct. 23, 1981, Ser. No. 314,457
Int. Cl.³ F16C *35/12, 19/08*
U.S. Cl. 308—189 R **14 Claims**

1. A bearing assembly for a spindle shaft comprising:

a housing adapted to be secured in a support member, said housing having arranged coaxially therein a cylindrical cavity, a first cylindrical aperture having an end wall and being located between said cavity and the exterior of a first end of said housing, and an at least partially threaded second cylindrical aperture between said cavity and a second end of said housing, said second aperture being of equal or greater diameter than said cavity;

said cavity having arranged therein coaxially therewith, in abutting relation and of outside diameter sufficiently less than the diameter of said cavity to allow sliding movement therein, and in order from said first end, a first spacer, a first sealed radial bearing, a second spacer, and a second sealed radial bearing, each of said spacers being of generally cylindrical configuration and of an inside diameter such that an end edge of the spacers abut the edge of only the outer races of the bearings;



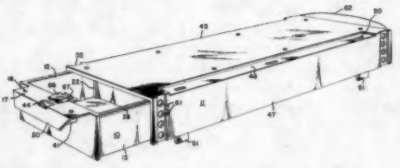
said second aperture having threadably engaged therewith an end screw plug, said screw plug having a cylindrical aperture therethrough coaxial with said second aperture and of larger diameter than the inner diameter of said bearings, the face of said screw plug having a cylindrical protusion thereon to abut the edge of only the outer race of said second bearing;

said spacers, bearings and end screw being of predetermined width such that said end screw holds said bearings and said spacers against the wall of the first end of said cavity to thereby prevent axial movement of the bearings within said assembly.

4,401,350
MODULAR STORAGE SYSTEM

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Continuation-in-part of Ser. No. 259,615, May 11, 1981, which is a continuation of Ser. No. 67,841, Aug. 20, 1979, abandoned.
This application Oct. 13, 1981, Ser. No. 310,946
Int. Cl.³ A47B *87/00*; E05C *19/10*
U.S. Cl. 312—107 **17 Claims**



1. A modular storage system for product packaging parts comprising:

(a) a plurality of housings;

(b) a drawer for each of said housings;

(c) each of said housings including a top wall and two parallel side walls, said top wall having a plurality of alignment slots adjacent said side walls, and alignment tabs extending downwardly from each of said side walls and registering with alignment slots of a housing disposed thereabove;

(d) each of said housings having along its side walls vertically extending recesses at each end;

(e) each of said drawers having a bottom wall and two side walls, a front wall including a first horizontally extending portion and an outer portion downwardly extending at an obtuse angle with respect to said first portion, for gripping and withdrawing the drawer, and a rear wall; and

(f) a locking member extending through a substantially rectangular cut-out in said first drawer portion, and an opening between said first drawer portion and said outer

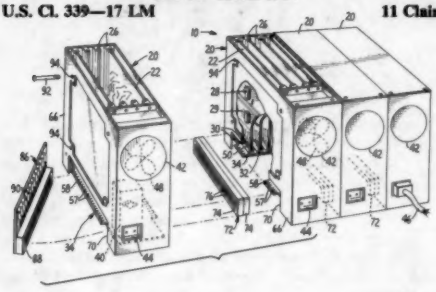
drawer portion, said locking member having a recess to snap into a downwardly extending ridge on the front end of said housing top wall, an actuating button extending through said cut-out, a retaining portion of said member having a tight fit with said opening, and a rearwardly extending spring member of said locking member resting on an extension of said cut-out in said drawer front wall for releasably securing said drawer to an associated housing.

4,401,351

EXPANDABLE CARD CAGE

Grant C. Record, Palo Alto, Calif., assignor to Advant Corporation, San Jose, Calif.

Filed Sep. 28, 1981, Ser. No. 305,940
Int. Cl.³ H05K 1/14
U.S. Cl. 339—17 LM **11 Claims**



1. A modular system for electrically interconnecting any number of printed circuit boards to a composite motherboard, the motherboard serving as a common connection for all of the printed circuit boards, said system comprising:

a support module defined by a housing adapted to hold a fixed number of individual printed circuit boards;

a motherboard mounted within the support module, and having a generally planar configuration, said motherboard including a first connector means to facilitate the electrical connection of said fixed number of printed circuit boards thereto, and with each side edge of one opposed pair of side edges of the motherboard including a second electrical connector means; and

coupling means adapted to link the motherboard of one module to the motherboard of another module, said coupling means having a pair of electrically interconnected third connector means each configured to mate with the second connector means of the motherboard whereby a plurality of printed circuit boards can be electrically interconnected by mounting the desired number of said printed circuit boards in a sufficient number of support modules and utilizing the coupling means to electrically link the motherboards of each module in series such that the combination of the motherboards and the coupling means defines a composite motherboard serving as a common connection for all the printed circuit boards.

4,401,352

CONNECTOR SYSTEM FOR CONNECTING A CERAMIC SUBSTRATE TO A PRINTED CIRCUIT BOARD

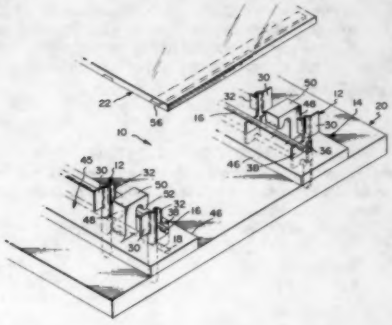
Jay M. Heisey, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1981, Ser. No. 312,200
Int. Cl.³ H05K 1/14
U.S. Cl. 339—17 CF **7 Claims**

1. A system for holding a ceramic substrate, or the like, and for electrically connecting the circuits thereon of circuits on a printed circuit board, the system comprising:

a. a plurality of conductive elements, each having a pin at the lower end for insertion into a printed circuit board for electrical contact with circuits thereon and a laterally extending plate, positioned above the pin, having an upwardly facing edge, said elements being arranged in two parallel, spaced apart rows with the plates facing inwardly the other row;

b. a pair of elongated elastomeric matrices, each having a base through which the conductive elements extend with the pins depending therefrom and a plurality of posts



projecting upwardly from the base and positioned between the conductive elements, said posts having a flange depending from a finger projecting laterally towards the other row, said flanges

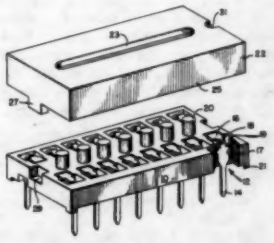
cooperating with the upwardly facing edges on the plates to form slots in which the opposing edges of the substrate are received with the circuits on the substrate being in electrical contact with the plates.

4,401,353

PROGRAMMABLE PLUG

John E. McDevitt, Jr., Cumberland, R.I., and Richard W. Petersen, Taunton, Mass., assignors to Augat Inc., Mansfield, Mass.

Filed Aug. 10, 1981, Ser. No. 291,807
Int. Cl.³ H01R 31/08
U.S. Cl. 339—18 C **12 Claims**



1. A programmable plug operative to electrically interconnect any terminal of the plug to any other terminal thereof, the plug comprising:

a body of electrically insulative material having a top surface and a bottom surface;

a plurality of electrical terminals secured in the body, each terminal having a pin portion outwardly extending from the bottom surface of the body, and a contact pad portion disposed on the top surface of the body;

the pad portions of the terminals being arranged in at least one in-line array; and

a plurality of posts on the body and upstanding from the top surface thereof in spaced arrangement substantially along

the body, each of the posts being longitudinally disposed between adjacent pad portions of each in-line array, and laterally disposed between opposing arrays;

the opposing pad portions of the respective in-line arrays defining a path therebetween for direct electrical connection by means of a wire connected therebetween;

adjacent pad portions of each in-line array and an intermediate post from said plurality of posts defining a path therebetween for electrical wire connection from one of the pad portions around the post to the adjacent pad portion;

the posts defining selectable paths for electrical wire connection from any pad portion to any pad portion of the same in-line array, and to any pad portion of the other in-line array.

4,401,354

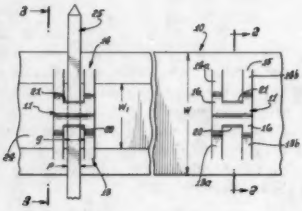
LOW COST BUS STRIP

Leo Walter, Palos Verdes Estates, and Helmut W. Greul, Rolling Hills Estates, both of Calif., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed Jul. 6, 1981, Ser. No. 280,927

Int. Cl.³ H01R *7/28*

U.S. Cl. 339—19 **14 Claims**



1. In an electrical bus strip to receive a terminal post, the combination comprising

(a) a horizontally elongated metallic bus strip;

(b) a contact integral with and spaced from said strip, said contact protruding toward a plane defined by said strip, and

(c) two pairs of arms having first ends integral with said strip and second ends integral with said contact to support the contact for resiliently yieldable movement normal to said planes in response to insertion of a terminal post into position between the arms of each pair and between the contact and two tongues defined by said strip,

(d) the bus strip defining an H-shaped opening adjacent said tongues and generally in registration with said contact and arms which were stamped from said strip.

4,401,355

FILTERED CONNECTOR

William C. Young, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 1, 1981, Ser. No. 279,459

Int. Cl.³ H01R *13/66*

U.S. Cl. 339—147 R **3 Claims**

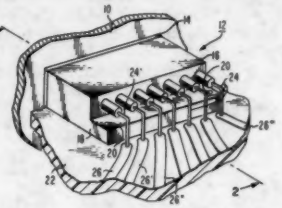
1. A radio-frequency filtering connector for use with a printed circuit board comprising:

an electrically conductive body having first and second coaxial cylindrical bores, said body including means for securing said body to said printed circuit board;

a dielectric plug closely received in said first bore, said plug having a bore coaxial with said first and second bores and concentric therewith, said plug tending to absorb stress induced by an applied force;

a radio-frequency filter device closely received in said second bore and rigidly mechanically supported by said body at the interface with said second bore, said device including a plurality of electrodes, at least one of said electrodes being ohmically connected to said body, said device comprising elements for conducting electrical signals in a given frequency range between the one and the remaining ones of said electrodes, said device including a fragile insulator which tends to fracture in response to stress having a bore coaxial with said plug bore and concentric with said first and second bores; and

an electrical conductor pin coaxial with and passing through said plug and filter device bores extending beyond said plug at one end and beyond said filter device at the other



end, said pin being closely received within said plug bore, said pin being ohmically connected to the remaining device electrodes whereby said device ohmically conducts signals in a certain frequency range from said pin to said body, said pin and filter device being related such that bending of the pin relative to the filter device can stress and possibly fracture said insulator whereby said plug structurally supports said pin and absorbs stresses induced by the bending of said pin portion extending beyond said plug bore.

4,401,356

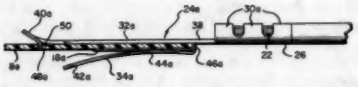
ELECTRICAL TERMINAL

Rex O. Bare, Lawrence, Kans., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 24, 1980, Ser. No. 209,543

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—258 R **3 Claims**



1. A terminal for making electrically conductive connection with a printed electrical conductor on one side of a thin flexible sheet of dielectric material, said terminal comprising; a resilient electrically conductive body having first and second opposite ends, said first end having attaching means for connection to an electrical conductor, said body having a blade section and a wiper section, the wiper section being struck from the blade section along a U-shaped line but remaining joined thereto at a region adjacent to said attaching means, said blade section upon the striking of the wiper section therefrom including a pair of substantially parallel, spaced leg portions and an end portion which interconnects the free ends of said leg portions remote from the location of attachment of the wiper section to the blade section, and said end portion cooperating with said leg portions to define an opening in said blade section, said wiper section being bowed and including an intermediate portion disposed in said opening defined in the blade portion and positioned between the spaced leg portions, the free ends of said wiper section and said blade section diverging in the direction toward said second end to facilitate reception of the dielectric sheet therebetween, such that the wiper section is adapted to engage in wiping contact the side of the sheet having the printed conductor thereon, and the blade section is adapted to engage the sheet on the side thereof opposite to said printed conductor, the joining of the free ends of said spaced

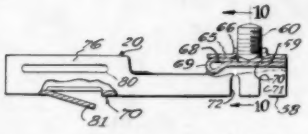
leg portion by said end portion restricting the flexibility of said blade section, such that upon engagement with said sheet, the wiper section will flex primarily with the intermediate portion of said wiper section engaging the printed conductor or said sheet and the spaced leg portion of the blade section applying opposed gripping forces to the opposite side of said sheet at locations offset laterally from that wherein said wiper section engages said sheet, and means on said body adapted to cooperate with said sheet for inhibiting relative sliding movement of the terminal with respect to said sheet.

4,401,357

ELECTRICAL CONNECTORS HAVING INSERT SPRING, CABLE CLIP AND CONTACTS WITH PRESSURE STRIPS

Harold A. Dvorachek, Iola, Kans., and Boleslaw M. Klimek, Des Plaines, Ill., assignors to Echlin Inc., Branford, Conn.

Filed May 12, 1980, Ser. No. 149,196
Int. Cl.³ H01R *11/10*
U.S. Cl. 339—272 R **4 Claims**



1. An electrical contact for connection to the end portion of a conductor of a wire, comprising: a trough portion arranged to receive said conductor end portion and including a pair of side walls and a bottom wall, a pressure strip extending longitudinally along said trough portion in upwardly spaced relation to said bottom wall for overlying the length of said conductor end portion and for movement toward said bottom wall to press said conductor end portion between said strip and said bottom wall, said strip having a width large enough to provide openings between it and said side walls which are smaller than the diameter of said conductor end portion, a fastener having a terminal end for engagement with a portion of said strip which is intermediate said one end thereof and an opposite end thereof for moving said strip toward said bottom wall, and a fastener support for supporting said fastener from said trough portion, said trough portion, pressure strip and fastener support being formed as integral parts of a single element of sheet metal, said element including a strip-support section extending from one of said side walls of said trough portion toward the other of said side walls of said trough portion and over said pressure strip with said pressure strip having an end connected through a 180 degree bend to one end of said strip-support section, said strip-support section having an opening therein through which said fastener element extends, and said fastener-support being in the form of a section of said element of sheet metal extending from the upper edge of said other of said side walls of said trough portion toward the upper edge of said one of said side walls of said trough portion in overlying relation to said strip-support section.

4,401,358

DEVICE FOR PREVENTING ERRONEOUS INSERTION OF A PLURALITY OF PRINT SUBSTRATES INTO CORRESPONDING CONNECTORS IN A RACK

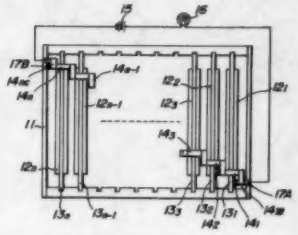
Masaaki Daigaku, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,363
Claims priority, application Japan, Jan. 14, 1980, 55-2824[U]
Int. Cl.³ H01R *3/00*; H05K *1/14*
U.S. Cl. 339—113 L **5 Claims**

1. An apparatus for preventing the erroneous insertion of a plurality of print substrates into corresponding connectors in a rack, comprising a rack provided with connectors and a plurality of print substrates adapted to be inserted into their respective connectors in the rack, wherein:

each of said print substrates is provided with an engagement mechanism detachably mounted thereon;

each engagement mechanism is provided with an engagement portion; and



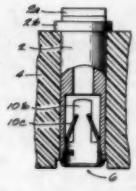
the engagement mechanism of each print substrate is engaged with the engagement mechanism of each adjacent substrate only when the print substrates are correctly inserted into said rack.

4,401,359

INTEGRATED WIRE TERMINATION SYSTEM TERMINAL WITH FASTENED RETAINER

Elmer S. Frelk, Sarasota, Fla., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1981, Ser. No. 316,459
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—253 R **5 Claims**



1. An integrated wire termination system comprising in combination:

an elongated contact-terminal having a contact at one end and a blind bore extending in from the other end, said bore having a stepped-diameter configuration including a small diameter bore at its inner end portion, an intermediate diameter bore at its middle portion, and a larger diameter bore at its outer end portion providing an annular shoulder between said middle and outer portions of said bore;

a split cylindrical retainer having a plurality of stops formed integrally thereon in angularly spaced relation thereabout and projecting outwardly to abut said annular shoulder so as to limit the depth of insertion of said retainer into said intermediate diameter bore, a pair of retention fingers bent toward one another and a pair of longer guiding and centering fingers bent toward one another and interspersed between said retention fingers within said intermediate diameter bore;

said contact terminal also having a thin section at the mouth of said bore rolled over the outer edge of said retainer to lock it rigidly between said rolled over thin section and said shoulder;

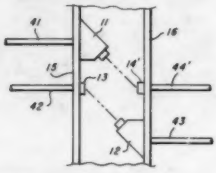
and an elongated connector pin secured to a wire and having a tip portion for free entry into said small diameter bore, an annular flange for locking by said retention fingers

when it is pushed past the ends thereof, and a stem to which said wire is connected.

4,401,360
OPTICAL SLIP RING

George L. Streckmann, and Jerry W. Yancy, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 4, 1980, Ser. No. 174,974
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.15 25 Claims



1. An optical slip ring for bilateral transmission of optical signals comprising:

(a) first optical fiber means and second optical fiber means, the optical fiber means being free to rotate with respect to each other;

(b) at least two optical emitters, a first emitter connected to the first optical fiber means for receiving first optical signals therefrom and for emitting second optical signals corresponding to the first optical signals, and a second emitter connected to the second optical fiber means for receiving third optical signals therefrom and for emitting fourth optical signals corresponding to the third optical signals;

(c) at least two optical receivers, a first receiver connected to the first optical fiber means, activated by the fourth optical signals received from the second emitter to transmit fifth optical signals corresponding to the fourth optical signals from the second emitter to the first optical fiber means, and a second receiver connected to the second optical fiber means, activated by the second optical signals received from the first emitter to transmit sixth optical signals corresponding to the second optical signals from the first emitter to the second optical fiber means; and

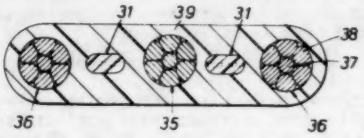
(d) first mounting means for mounting and positioning the first optical emitter off center and the first optical receiver on the axis of rotation and second mounting means for mounting and positioning the second optical emitter off center and the second optical receiver on the axis of rotation, the emitters and receivers being positioned to permit optical communication between the first optical emitter and the second optical receiver, and between the second optical emitter and the first optical receiver, the first and second mounting means being free to rotate with respect to each other.

4,401,361
OPTICAL GUIDES

Raymond J. Slaughter, Chislehurst, England, assignor to BICC Limited, London, England

Continuation of Ser. No. 367,125, Jun. 5, 1973, abandoned. This application Jan. 31, 1977, Ser. No. 763,985
Claims priority, application United Kingdom, Jun. 6, 1972, 26339/72; Nov. 10, 1972, 52098/72; Dec. 8, 1972, 56727/72
The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.23 10 Claims

1. An optical cable comprising at least one optical bundle comprising at least one group of fibres of which at least some are optical fibres; at least two separate elongate reinforcing members arranged with their axes and the axis of at least one optical bundle lying substantially in a common plane and with the at least one optical bundle located between and spaced from two reinforcing members, each reinforcing member having an overall dimension perpendicular to said common plane that is substantially greater than the corresponding overall dimension of the at least one optical bundle so that the at least

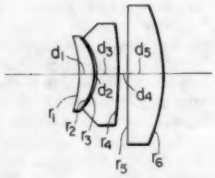


one optical bundle lies in the space bounded by two planes one located on each side of the two members and each touching both members; and an extruded outer protective sheath which surrounds and fills the interstices between the at least one bundle and the reinforcing members.

4,401,362
F—θ LENS SYSTEM

Haruo Maeda, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,948
Claims priority, application Japan, Jul. 15, 1980, 55-96385
Int. Cl.³ G02B 9/14, 27/17
U.S. Cl. 350—6.8 6 Claims



1. An f—θ lens system consisting of the first lens element which is a positive lens, the second lens element which is a negative lens and the third lens element which is a positive lens and satisfying the following conditions:

$$0.13f \leqq L \leqq 0.19f \quad (1)$$

$$0.9 \leqq r_2/r_3 \leqq 1.15 \quad (2)$$

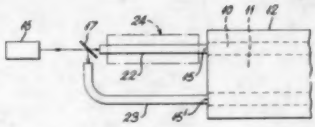
$$-1.65f \leqq f_{12} \leqq -0.3f \quad (3)$$

wherein the reference symbol f represents a focal length of the entire system, the symbol f_{12} represents a composite focal length of the first lens element and second lens element, the symbol L represents an entire length of the lens system and the symbols r_2 and r_3 represent respective radii of curvature of the surface on the light exit side of the first lens element and of the surface on the light entrance side of the second lens element.

4,401,363
OPTICAL WAVEGUIDE AND METHOD OF PROPAGATING WAVES THEREIN

Harold E. M. Barlow, Epsom, England, assignor to National Research Development Corporation, London, England

Filed Sep. 29, 1980, Ser. No. 192,035
Claims priority, application United Kingdom, Oct. 15, 1979, 7935744
Int. Cl.³ G02B 5/172, 5/176
U.S. Cl. 350—96.3 15 Claims



1. A transmission system comprising means for generating periodically varying signals, an optical waveguide having a tubular wall capable of supporting propagation in all of the modes HE_{11}, TE_{01} and TM_{01}, and

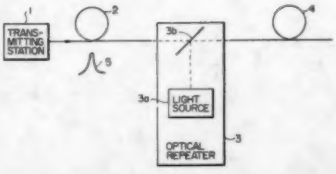
means for handling waves in up to but not more than two of the said modes but not both the TE_{01} and TM_{01} modes, on the waveguide,

the optical waveguide comprising a tube of a first solid optical material having a wall thickness equal to, or greater than, substantially half the maximum radial wavelength of the said waves in the first optical material and such that the phase-change of the waves within the tube wall and normal to the wall surfaces is sufficiently small to ensure that the electromagnetic fields inside and outside the tube walls, due to the said waves, are evanescent, and the tube containing and being surrounded by a second solid optical material or materials, the first optical material being of higher permittivity than the second optical material or each of the second optical materials, and the first optical material and the second optical material or materials each having a specific dielectric conductivity of less than 10^{-4} mhos per meter.

4,401,364
OPTICAL REPEATER SYSTEM FOR OPTICAL COMMUNICATION

Kiyofumi Mochizuki, Tokyo, Japan, assignor to Kokusai Denshi Denwa Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,463
Claims priority, application Japan, May 26, 1980, 55-068827
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.16 5 Claims

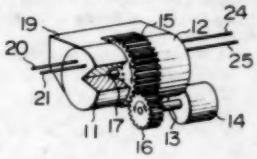


1. An optical repeater system for optical communication comprising a light source for emitting a pumping light of frequency ν_O, means for providing an optical communication signal light, an optical fiber, and a beam splitter synthesizing and directing the pumping light and the optical communication signal light into said optical fiber for concurrent propagation through said fiber, the optical communication signal light containing a frequency component of a Stokes light to be induced by said pumping light due to the Raman effect in the optical fiber, the pumping light and optical communication signal light interacting with one another in said optical fiber whereby the induced Raman effect and the dispersion characteristic of said optical fiber function to amplify the optical communication signal light.

4,401,365
ROTARY TYPE OPTICAL SWITCH

Sadao Mizokawa; Yoshiji Ito, both of Hitachi; Yasuo Hosoda, Tokaimura; Hiroshi Kaita; Tadaaki Okada, both of Hitachi; Hiroaki Ohnishi, Tokaimura; Seiichi Yasumoto; Hitoshi Fushimi, both of Hitachi; Jushi Ide, Mito, and Hiroshi Kuwahara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 232,193
Claims priority, application Japan, Feb. 8, 1980, 55-15312; Feb. 8, 1980, 55-15313
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 2 Claims



1. A rotary-type optical switch for switching optical transmission paths by changing-over facing mates of opposing junction faces of optical transmission paths, said switch comprising:

(A) a pair of optical transmission path mounting members aligned along an axis, with their respective plane portions which are opposite to each other;

(B) a plurality of junction faces of optical transmission paths disposed on said respective plane portions along phantom circles which are opposite to each other and concentric which said pair of mounting members respectively with respect to said axis so that the junction faces on said respective plane portions are capable of being correspondingly opposite to each other;

(C) an optical path relay member interposed between said pair of mounting members such that it is rotatable about said axis, and having opposite plane portions close to said respective plane portions of said pair of mounting members, and a plurality of optical transmission paths incorporated therein, the junction faces on the opposite plane portions of said optical transmission paths of said optical path relay member being capable of being correspondingly opposite to those on said respective plane portions of said pair of mounting members; and

(D) a supporting stand to which said pair of mounting members are fixedly attached.

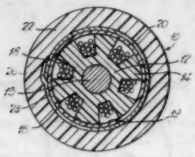
4,401,366
POWDER FILLED FIBER OPTIC CABLE

Tomasz S. Hope, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 30, 1981, Ser. No. 259,009
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.23 20 Claims

11. An optical cable comprising a crush resistant core formed with a plurality of circumferentially spaced, longitudinally extending ribs defining grooves between them, a plurality of optical waveguides within and extending along the grooves and a protective sheath surrounding the core and waveguides, the grooves also containing a mixture of a hydrophilic and

hydrophobic powder in contact with the waveguides, the hydrophilic powder in contact with water being substantially



non-swellable and forming a viscous solution and preventing the formation of ice crystals.

4,401,367

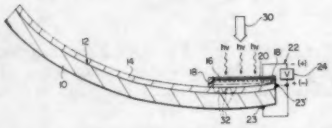
METHOD FOR PATTERN MASKING OBJECTS AND THE PRODUCTS THEREOF

Daniel H. Grantham, Glastonbury, and James L. Swindal, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,824

Int. Cl.³ G02B *5/18*

U.S. Cl. 350—162.22 **38 Claims**



1. A method for pattern-masking a surface of an object comprising the steps of:

applying a thin, substantially uniform coating of a semiconductive mask material over said surface of said object;

applying and maintaining an electrolytic etchant on the outer surface of said semiconductive mask material;

projecting through said etchant and onto said semiconductive mask material electromagnetic radiation patterned in accordance with the pattern to be formed in the mask, the energy corresponding with wavelength of said electromagnetic radiation being at least as great as the band gap energy of said semiconductive mask material, whereby said semiconductive mask material, whereby said semiconductive mask material electrochemically reacts with and is etched by said etchant at a rate which is substantially faster where said radiation is incident thereon than where it is not; and

continuing said photoelectrochemical etching of said semiconductive mask material until a desired depth of etch has been attained.

4,401,368

PROJECTING SCREEN FOR OPTICAL PURPOSES

Ludwig Drechsel, Jena, and Margarete Lasch, Jena-Lobeda, both of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Oct. 8, 1981, Ser. No. 309,659

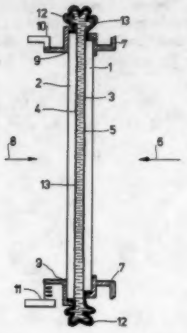
Claims priority, application German Democratic Rep., Dec. 23, 1980, 226555

Int. Cl.³ G03B *21/60*

U.S. Cl. 350—126 **19 Claims**

1. A projecting screen comprising

(A) two solid media which are movable with respect to one another, at least one of which is light-scattering with a surface roughness of 4.5 μm to 17 μm on one side thereof, the distance between opposite surfaces of said two media between 0.004 mm and 0.5 mm; and



(B) a liquid between said two media (A), in which the refractive index differential Δn_d^{20} between said liquid (B) and said solid media (A) is from 0.180 to 0.350.

4,401,369

CLASS OF DICHROIC DYES FOR USE WITH LIQUID CRYSTALS

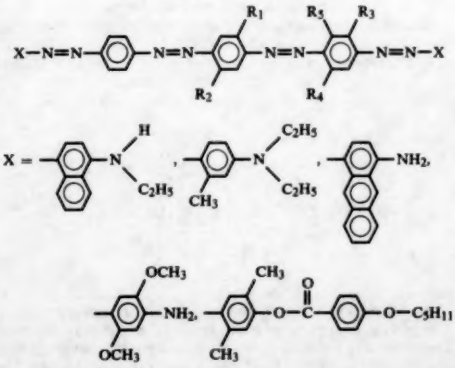
Derick Jones, Doylestown, Pa., assignor to Electronic Display Systems, Inc., Hatfield, Pa.

Filed Oct. 19, 1981, Ser. No. 312,678

Int. Cl.³ C09K *3/34*; G02F *1/13*; C09B *31/30, 33/18, 35/50*

U.S. Cl. 350—349 **19 Claims**

1. A cholesteric guest-host liquid crystal composition having a positive dielectric anisotropy comprising a phenylcyclohexane-containing positive nematic host component, an optically active cholesteric component, and a tetra-azo dichroic dye guest component capable of fully dissolving in said host component at concentration levels associated with dyes having fewer azo groups and having a dichroic ratio of at least 0.72, said tetra-azo dye selected from the group consisting of



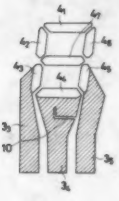
$R_1 = -OCH_3, H$
$R_2 = -CH_3, H$
$R_3 = -OCH_3, H$
$R_4 = -CH_3, H$
$R_5 = -CH_3, H$

4,401,370

LEAD-IN ELECTRODE STRUCTURE FOR ELECTROCHROMIC DISPLAYS OF THE SEGMENTED TYPE

Takaaki Miyazaki; Sadakatsu Hashimoto, and Mitsuru Nishiyama, all of Nara, Japan, assignors to Sharp, Osaka, Japan

Filed Jul. 10, 1980, Ser. No. 168,248
Claims priority, application Japan, Jul. 12, 1979, 54-96372[U]
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 13 Claims



1. In an electrochromic display device including two substrates, display segments formed on one of said two substrates, a counter electrode formed on the other of said two substrates, and an electrochromic material for coloring said display segments upon receiving a predetermined current or voltage, the improvement comprising:

terminal means formed on said one of said two substrates for connecting the electrochromic display device to a driver circuit;

lead-in electrode means including a plurality of electrodes for connecting said display segments to corresponding terminal means;

said electrodes and display segments being formed on substantially the entire surface of said one of said two substrates, each said electrode covering a selected area portion of said one substrate;

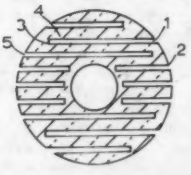
at least one of said electrodes comprising means within its selected area portion for varying the electrical resistance of said at least one electrode.

4,401,371

HYDROGEL OXYGEN GENERATOR WITH IMPROVED FLUID FLOW

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 78,171, Sep. 24, 1979, Pat. No. 4,268,132. This application Oct. 25, 1980, Ser. No. 98,669
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.³ G02C 7/04
U.S. Cl. 351—160 R 6 Claims



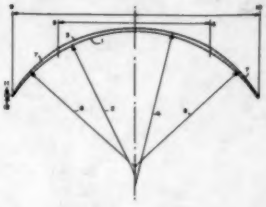
1. An oxygen and hydrogen generator comprising a water containing polymer having a plurality of photosensitive particles imbedded within the polymer which produce both hydrogen and oxygen by the photoelectrolysis of water when the photosensitive particles are excited by being exposed to light, said polymer having a plurality of open ended tubes extending into the polymer structure whereby the generated oxygen and hydrogen may pass within the tubes to the polymer surface.

4,401,372

CONTACT LENS

William L. Mancini, Framingham; Donald R. Korb, Boston, and Miguel F. Refojo, Lexington, all of Mass., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 736,555, Oct. 28, 1976, Pat. No. 4,180,308, which is a continuation-in-part of Ser. No. 685,996, May 13, 1976, Pat. No. 4,056,496, which is a continuation-in-part of Ser. No. 451,906, Mar. 18, 1974, Pat. No. 3,957,362, which is a continuation-in-part of Ser. No. 294,019, Oct. 2, 1972, abandoned. This application Dec. 10, 1979, Ser. No. 101,981
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.³ G02C 7/04
U.S. Cl. 351—160 H 19 Claims



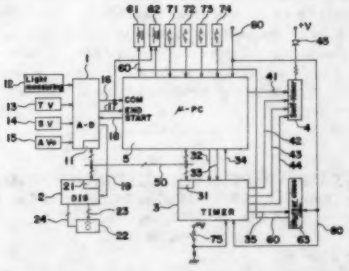
1. A soft, supple hydrogel contact lens having a cross-sectional thickness up to 0.15 mm and being of a hydrogel material sufficiently rigid so as not to irreversibly deform during blinking and sufficiently flexible so as to conform to the curvature of the eye.

4,401,373

EXPOSURE CONTROL ARRANGEMENT FOR PHOTOGRAPHIC CAMERAS

Masaaki Nakai, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 101,252, Dec. 7, 1979, Pat. No. 4,297,012. This application Jul. 23, 1981, Ser. No. 285,879
Claims priority, application Japan, Dec. 13, 1978, 53-154841; Dec. 25, 1979, 54-163900
Int. Cl.³ G03B 7/091
U.S. Cl. 354—23 D 7 Claims



1. A digital exposure control for cameras comprising:

a common transmiting means for transmitting signals which are each composed of a plurality of bits;

a microprocessor for controlling camera operations, said microprocessor sequentially producing a plurality of control signals which are each composed of a plurality of bits and outputting said control signals to said common transmitting means; and

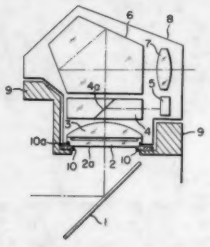
a means having a register and operatively connected to said common transmitting means for selectively practicing one of a plurality of predetermined camera exposure functions in response to a control signal from said microprocessor received at said register through said common transmitting means, whereby said practicing means practices said camera exposure functions one by one in correspondence with said control signals received by said register one by one.

4,401,374

INTERCHANGEABLE FINDER DEVICE

Makoto Kimura, Tokyo, and Hiroshi Terunuma, Ichikawa, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,513
Claims priority, application Japan, Sep. 11, 1980, 55-126498
Int. Cl.³ G03B *7/08, 13/02*
U.S. Cl. 354—25 **4 Claims**



1. In an interchangeable finder device of a single lens reflex camera having a finder optical system in which a focusing screen, a pentaprism and an eyepiece are fixed in a predetermined positional relation, a casing containing said optical system therein, and a mounting-dismounting device provided on said casing to mounting said casing to the camera body, the improvement comprising a sliding mechanism for supporting said finder optical system slidably in a direction perpendicular to the focus surface of said focusing screen relative to said mounting-dismounting mechanism so that said finder optical system can move in said perpendicular direction independently of said mounting-dismounting device when said casing is mounted to said camera body by means of said mounting-dismounting device.

3. The improvement recited in claim 1, wherein said interchangeable finder device further has light-receiving means for receiving light passed through said focusing screen and producing an output corresponding to the focus adjusted condition of a phototaking lens, said light-receiving means being fixed in a predetermined positional relation with said finder optical system.

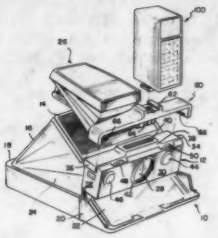
4,401,375

FLASH ADAPTER FOR FOLDING CAMERA

Stephen D. Senour, 2070 E. 54th St., Indianapolis, Ind. 46220

Filed Oct. 26, 1981, Ser. No. 314,714
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—141 **10 Claims**

1. A flash adapter for a folding camera, comprising means to interconnect electrically a conventional flash hot shoe and the flash socket assembly of the folding camera and to support and operate an electronic flash assembly, said means including a resilient bracket adapted to engage the sides of the shutter housing of the folding camera and carry an electronic flash attachment, a plug carried by the bracket at its underside to fit into the flash socket assembly on the camera shutter housing, a hot shoe carried by the bracket at its top surface, and an electronic circuit carried within the bracket and adapted to provide a flash-ready signal to camera and to operate the electronic flash upon operation of the camera shutter, said means



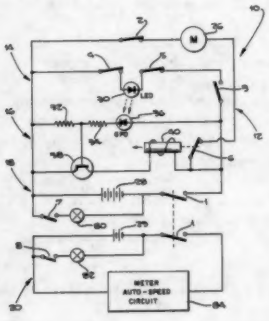
thereby being adapted to mechanically support and operate the electronic flash.

4,401,376

FILM DESIGN AND IMPROVED CIRCUIT THEREFOR ENABLING UTILIZATION OF GREATER FILM EXPOSURE AREA

Laszlo Pomazi, 1323 12th St., Santa Monica, Calif. 90401

Filed Mar. 15, 1982, Ser. No. 358,028
Int. Cl.³ G03B *1/12*
U.S. Cl. 354—173 **2 Claims**



1. An improved photographic film design and improved film advance circuit therefor enabling utilization of greater film exposure area with conventional size film and a conventional camera comprising:

a. a length of photographic film containing a multiplicity of pinholes adjacent one lengthwise edge and spaced apart from each other by equal predetermined distances;

b. a film advance circuit used in conjunction with said length of photographic film;

c. said film advance circuit comprising a motor circuit, a first interior circuit, and a second interior circuit;

d. said motor circuit comprising a first switch, a second switch, and a third switch;

e. said motor circuit further comprising a motor between said second switch and said third switch, and a battery between said third switch and said first switch;

f. said first interior circuit comprising a first switch, a second switch, and a third switch;

g. said first interior circuit further comprising a light emitting diode located between said first switch and said second switch, and a first resistor, a second resistor, and a Germanium photo diode located between said second switch and said third switch;

h. said second interior circuit comprising said first resistor, and said second resistor, and said Germanium photo diode of said first interior circuit;

i. said second interior circuit further comprising a transistor, a solenoid, and said second switch of said motor circuit, all located between said first resistor and said Germanium photo diode;

j. said light emitting diode and said Germanium photo diode being located in a substantially parallel plane such that the Germanium photo diode can sense the light signal from the light emitting diode if there is no barrier between them;

k. said length of photographic film being located between said light emitting diode and said Germanium photo diode such that said multiplicity of pinholes in the photographic film are in substantially the same plane as the light emitting diode and the Germanium photo diode;

l. said second switch of said motor circuit being in a normally closed position;

m. said third switch of said motor circuit and said first and second switch of said first interior circuit being located such that they are closed when the camera body is closed; and

n. said first switch of said motor circuit being capable of manual closure by the operator;

o. whereby after said camera is closed and said first switch is manually closed, said motor circuit is thereby closed and said motor begins to run and causes said length of photographic film to advance within said camera and cock the shutter and mirror box of the conventional camera which thereby closes the third switch of said first interior circuit, whereby said first interior circuit is closed and the light emitting diode receives power thereby transmitting a beam of light and when a pinhole arrives in front of the light emitting diode light is allowed to pass to the Germanium photo diode which senses the light and activates and second interior circuit which thereby activates said transistor which in turn causes said solenoid to move and open said second switch of said motor circuit, thereby causing the motor circuit to be opened and the motor to stop running which in turn causes the length of photographic film to stop advancing and ready the film for exposure, and after the exposure is made the camera shutter and mirror box are released from their cocked position and as a result the third switch of said first interior circuit is opened, the first interior circuit is thereby broken, the light emitting diode is thereby turned off which in turn causes the Germanium photo diode to be deactivated so that the transistor ceases to conduct and the solenoid is turned off, thereby allowing the second switch of said motor circuit to return to its closed position to thereby close said motor circuit and permit the cycle to begin again, therefore the multiplicity of pinholes in the film in conjunction with the film advance circuit permits the length of film to be advanced from one exposure to the next and the use of large sprocket holes in the film to advance it is eliminated, thereby creating a greater amount of film exposure area and enabling utilization of greater film exposure area with conventional size film.

4,401,377

MOTOR-DRIVEN FILM TRANSPORTING DEVICE IN A SINGLE LENS REFLEX CAMERA INCLUDING MEANS FOR SELECTIVELY DRIVING FILM IN A WIND-UP MODE AND A REWIND MODE

Akihiko Sato, Kawasaki, and Kenichi Magariyama, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

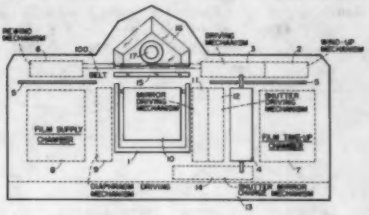
Filed Nov. 18, 1981, Ser. No. 322,574

Claims priority, application Japan, Nov. 27, 1980, 55/167258

Int. Cl.³ G03B 1/18

U.S. Cl. 354—173 **4 Claims**

1. In a single lens reflex camera including a film transporting device capable of selectively effecting a wind-up mode in which a roll film wound on a first spool is taken up by a second spool after it has passed the focal plane of a phototaking lens and a rewind mode in which said film wound on said second spool is taken up by said first spool, and a mirror box for holding a reflecting mirror disposed across the light beam from said phototaking lens imaged on said focal plane for reflecting said light beam in a plane substantially orthogonal to the direction of transport of said film, said mirror being mounted for pivotal movement about an axis passing through one end thereof for retraction from said light beam, the improvement in said transporting device comprising:



drive means for selectively rotating said first and second spools in response to selection of said modes, said drive means including a drive shaft disposed on a side opposed to said first spool with respect to said mirror box, belt means for transmitting the rotation of said drive shaft to said first spool, and means for guiding said belt means substantially in parallelism to the direction of transport of said film near the pivot of said reflecting mirror outside said mirror box.

4,401,378

CAMERA HAVING AUTOMATIC FOCUS FUNCTION AND AUTOMATIC EXPOSURE FUNCTION

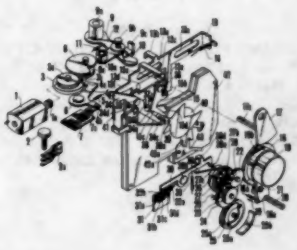
Michio Hirohata, Inagi, and Hideo Ikari, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,272

Claims priority, application Japan, May 9, 1981, 56-69767

Int. Cl.³ G03B 3/10, 9/14

U.S. Cl. 354—195 **5 Claims**



1. A camera equipped with a focus adjusting mechanism for automatically moving a photographic lens to an in-focus position based on camera-to-object distance information and an exposure control mechanism for automatically controlling exposure based on object brightness information, comprising:

(a) a coil positioned in a magnetic field, said coil exerting an electromagnetic force in different directions depending upon the direction of current flow therethrough;

(b) a rotor arranged to rotate in response to the electromagnetic driving force exerted on said coil,

(c) blade members connected to said rotor driven to open and close;

(d) control means for controlling the operation of the focus adjusting mechanism by one cycle of operation of said rotor as said rotor is turned in a direction to close said blade members when a first current is supplied; and

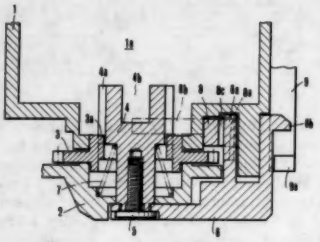
(e) changeover means arranged to be switched in response to termination of the operation of said focus adjusting mechanism so that the direction of current flow to said coil is reversed.

4,401,379

FILM FEEDING DEVICE FOR CAMERA

Hideo Tamamura, Tokyo, and Toru Nagata, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,580
Claims priority, application Japan, Mar. 25, 1981, 56-43443
Int. Cl.³ G03B *1/40, 17/02*
U.S. Cl. 354—214 **11 Claims**



1. A film feeding device for a camera adapted to receive film cartridges and including a rewind fork which is moved from a first position to a second position where engagement between a spool shaft of said cartridge and the rewind fork is released, comprising:

(a) holding means for holding said rewind fork in said second position;

(b) sensing means responsive to both insertion of a cartridge into a cartridge chamber of said camera and closure of a back cover of said camera for releasing said rewind fork from the holding connection with said holding means; and

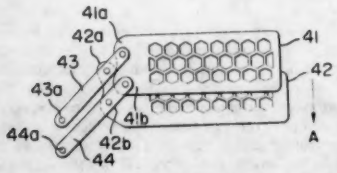
(c) bias means urging said rewind fork towards said first position.

4,401,380

BLADE FOR FOCAL PLANE SHUTTER

Akihiko Sato; Yoshiyuki Nakano, and Etsuo Tanaka, all of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 955,194, Oct. 27, 1978, abandoned.
This application Feb. 9, 1982, Ser. No. 347,281
Claims priority, application Japan, Oct. 31, 1977, 52-129672; May 26, 1978, 53-70456
Int. Cl.³ G03B *9/40, 9/36*
U.S. Cl. 354—246 **14 Claims**



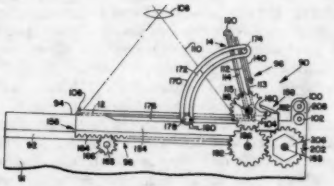
1. A shutter blade for a focal plane shutter comprising an opaque plate adapted to move across a film exposure aperture, the plate having a connecting portion adapted to connect the blade to a drive mechanism, having an outer peripheral edge portion contiguous with the connecting portion, the outer peripheral edge portion circumscribing the edge of the plate and defining the outer boundary thereof, and having an interior portion within the peripheral edge portion, the interior portion including a plurality of recesses greater than two of a regular polygonal shape, each recess being of the same size and shape, and a plurality of ribs connected together and to the peripheral edge portion, adjacent recesses being separated by one of said ribs and being symmetrically disposed with respect to said one rib, the connecting portion and the peripheral edge portion defining areas of the shutter blade having greater thickness than the areas of said recesses, which recess areas do not penetrate the thickness of the plate, and wherein the connecting portion, the peripheral edge portion, and the ribs are arranged to carry mechanical stresses applied to the blade and to relieve the recesses of mechanical stresses.

4,401,381

PROCESSING APPARATUS FOR SELF-PROCESSING FILM UNIT WITH A FOLDED APPLICATOR

Vincent L. Cocco, Wakefield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 22, 1982, Ser. No. 436,078
Int. Cl.³ G03B *17/52*; G03D *9/00*
U.S. Cl. 354—303 **13 Claims**



1. Processing apparatus for use with a self-processing film unit of the type including a sheet-like film component including one or more photosensitive layers and having an outer surface with a given area thereof that is configured to be wetted with a low-viscosity processing liquid to initiate processing of the one or more layers, and a liquid applicator secured to one end of the film component and including an impervious sheet carrying on an inner surface thereof means yieldably holding a substantially uniformly distributed supply of such liquid, the applicator being initially provided in a folded and releasably sealed configuration forming an impervious enclosure about the liquid holding means, and being configured for movement to an unsealed extended configuration overlying the outer surface with the liquid holding means in liquid yielding contact with the given area to effect wetting thereof, said apparatus comprising;

means for supporting such a film unit; and

means, engageable with the folded applicator, for unsealing the impervious sheet and for moving the unsealed applicator to its extended configuration to locate the liquid holding means in liquid yielding contact with the given area to effect wetting thereof.

4,401,382

IMAGE TRANSFER TYPE COPYING MACHINE

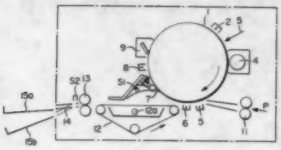
Teruo Minejima, and Isao Sakurai, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

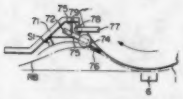
Filed Sep. 3, 1981, Ser. No. 298,952
Claims priority, application Japan, Sep. 18, 1980, 55-130227
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **6 Claims**

1. In an improved image transfer type copying machine including an image retaining member for receiving a toner image of an original to be copied and into contact with which a sheet for bearing a copy of the original is placed to transfer the toner image to the sheet, and primary means for normally

separating the sheet from the image retaining member, the improvement comprising:

secondary means located downstream of said primary means along the image retaining member for separating a sheet from the member in the absence of normal separation of the sheet by said primary means, said secondary means comprising a freewheeling roller, means pivotally supporting said





roller so that the roller rides on and along the image retaining surface of said member, and a separating blade mounted on said roller supporting means to maintain said blade in constant and predeterminately spaced relation to the member surface so that a sheet may be separated from the member by said blade without contact between the member surface and the blade.

4,401,383

TRANSFER DEVICE FOR USE IN RETENTION TYPE ELECTROPHOTOGRAPHIC COPYING MACHINE

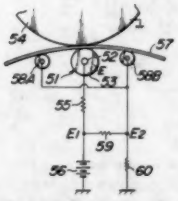
Yoshiro Suzuki; Tadahiro Yasuda; Masaji Nishikawa; Eiichi Sato, and Tadashi Aoki, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,904

Claims priority, application Japan, Oct. 16, 1980, 55-143695

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **9 Claims**



1. A transfer device for use in a retention type electrophotographic copying machine in which a plurality of copies are formed from the same and single electrostatic charge image once formed on a charge retentive member by subjecting repeatedly the charge image to developing and transferring steps, said transfer device comprising:

a transfer member having a conductive shaft and a roller which is arranged around said shaft and is made of semiconductive material, said roller being arranged in the vicinity of said charge retentive member;

a resistor connected in series with said conductive shaft;

first transfer bias voltage source means for applying a first transfer bias voltage to said roller through said resistor;

an auxiliary transfer member arranged in the neighborhood of said transfer means and being in contact with a record paper; and

second transfer bias voltage source means for applying a second transfer bias voltage to said auxiliary transfer member; said first and second transfer bias voltages being set to such values that, when said record paper is in a higher resistance condition, the first transfer bias voltage becomes operative to produce a transferring electric field, and, when said record paper is in a lower resistance condition, said second transfer bias voltage becomes effective to generate the transferring electric field, so that an injection of charge into a background area of the charge image on the charge retentive member is prevented.

4,401,384

MIRROR DEVICE OF COPYING MACHINE OR THE LIKE

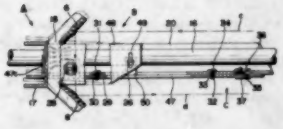
Tadashi Abe, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jul. 31, 1981, Ser. No. 289,122

Claims priority, application Japan, Aug. 8, 1980, 55-112310[U]; Aug. 29, 1980, 55-122485[U]

Int. Cl.³ G03G *15/00*; G03B *27/70*

U.S. Cl. 355—11 **15 Claims**



1. A mirror support assembly comprising:

an elongated member; and

a pair of support members rigidly secured to said elongated member in spaced apart relationship relative to each other;

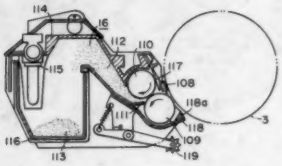
said pair of support members together comprising three protuberences which lie in and define one mirror locating plane;

said pair of support members together further comprising three other protuberences which lie in and define another mirror locating plane which intersects said one mirror locating plane at a predetermined angle.

4,401,385
IMAGE FORMING APPARATUS INCORPORATING THEREIN OZONE FILTERING MECHANISM

Hajime Katayama, Kawasaki; Tateki Nagaoka, Yokohama; Yusaku Takada, Tokyo; Shigeyoshi Onoda, Kawasaki; Atsushi Kubota, Komae; Hiroshi Hara, Tokyo, and Masashi Suda, Iruma, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 167,344, Jul. 10, 1980, abandoned. This application Jun. 3, 1982, Ser. No. 384,640
Claims priority, application Japan, Jul. 16, 1979, 54-91164
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—15 **6 Claims**



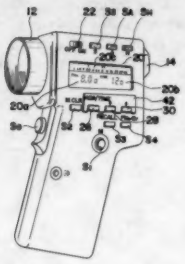
1. An image forming apparatus, comprising:
a rotatable photosensitive member in a housing;
a short focus image forming element array for exposure provided above said photosensitive member;
image transfer means disposed beneath said photosensitive member;
developing means provided on one side between said image forming element array and said image transfer means;
cleaning means provided on the other side between said image forming element array and said image transfer means, said cleaning means being disposed in contact with said photosensitive member, for removing the residual developer from the image bearing member;
guiding means, disposed upstream of the contact between said cleaning means and the photosensitive member with respect to movement of the photosensitive member, for guiding the developer removed from the member away from the surface thereof;
a stopper member, mounted to a side of said cleaning means which is remote from the photosensitive member, for stopping the leading edge of the transfer material which incidentally comes to said cleaning member; and
an ozone filter provided at the side of said cleaning means.

4,401,386
LIGHT MEASURING DEVICE

Yoshio Yuasa, Kawachinagano, and Kazuhiko Naruse, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1980, Ser. No. 208,474
Claims priority, application Japan, Nov. 29, 1979, 54/155275
Int. Cl.³ G01J *1/44*
U.S. Cl. 356—226 **14 Claims**

1. A light meter comprising:
a receiving means for receiving light and for producing a light intensity signal which varies with the intensity variations of the received light;
a storing means for storing at least one light intensity signal produced from said receiving means;
a selecting means for selecting one light intensity signal from the light intensity signals received by the receiving means or stored by the storing means;
a first display means for dislaying, through numeral figures, a value depending on the selected light intensity signal; and
a second display means for sequentially displaying, by means of selective actuation of display dots, values rspectively

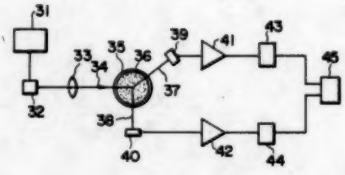


depending on light intensity signals obtained from said receiving means and from said storing means.

4,401,387
NEPHELOMETRIC IMMUNOASSAY AND NEPHELOMETER

Daizo Tokinage; Teruaki Kobayashi; Mitsuyoshi Yuasa, all of Hachioji; Michio Itoh, Tokorozawa, and Kazuo Yasuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 40,205, May 18, 1979, abandoned. This application Aug. 18, 1981, Ser. No. 294,055
Claims priority, application Japan, May 19, 1978, 53-58933
Int. Cl.³ G01N *21/51, 21/75, 33/48*
U.S. Cl. 356—341 **17 Claims**



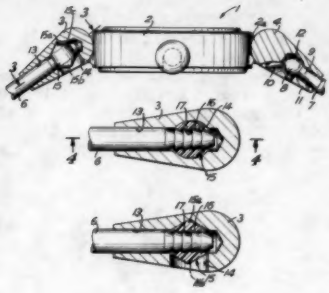
1. A nephelometric immunoassay characterized in that light is projected on an unknown sample to-be-measured containing an antigen-antibody complex formed by a reaction of an antigen and an antibody solution, that at least two light scattering intensities at different angles with respect to the incident light are measured, and that a true antigen concentration is discriminated using only a single sample concentration of said unknown sample from plural antigen concentration values which are obtained from the measurement of each light scattering intensity from said single sample concentration by comparing said plural antigen concentration values, wherein the discrimination of the true antigen concentration is determined by numerically determining whether $|\ln C\alpha - \ln C\beta|$ is less than $|\ln C'\alpha - \ln C'\beta|$, wherein $C\alpha$ and $C'\alpha$ denote values of antigen concentrations for light scattering intensity of one angle and $C\beta$ and $C'\beta$ denote values of antigen concentrations for light scattering intensity of another angle.

4,401,388

ROTATABLE CONNECTOR FOR BANGLE WRISTWATCH ATTACHMENT

Alec R. Mearns, Dundee, Scotland, assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 29, 1982, Ser. No. 373,323
Int. Cl.³ G04B 37/00
U.S. Cl. 368—282 7 Claims



1. In a wristwatch having a bezel with first and second lugs on opposite side thereof, and a bangle having first and second opposite ends connected to the respective lugs to hold the wristwatch on a wrist, one of said lug and bangle connections being adapted for disconnecting and the other connection being permanent, the improvement in said permanent connection comprising:

a first bangle end having a barbed configuration thereon,

said first lug defining an axial hole receiving the first bangle end and defining a transverse hole intersecting said axial hole, and

a retaining member of a size and shape adapted to enter the transverse hole and having portions interfering with its rotation or withdrawal through the axial hole, said retaining member having an interference hole therein receiving the first bangle end and forming an interference fit with said barbed configuration to prevent withdrawal of the retainer and bangle end from the first lug, and permitting rotation of the bangle end within said interference hole.

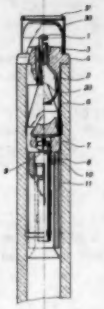
4,401,389

MEASURING PROBE FOR TAKING A SAMPLE FROM A METAL BATH AND FOR MEASURING THE BATH TEMPERATURES

Alfons L. M. C. Theuwis, Zonhoven, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Jan. 15, 1982, Ser. No. 339,806
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 8101697[U]
Int. Cl.³ G01N 1/12
U.S. Cl. 374—140 9 Claims

1. A measuring probe for simultaneously taking a sample from a molten metal bath and for measuring a parameter of the bath comprising a sample container and a device for measuring a parameter of a molten metal bath each disposed on a common head piece, said head piece including a cylindrical body having a collar at one end, said body partially receiving a sample container, said head piece having its other end inserted into one end of a connecting tube, the other end of the connecting tube being secured to and closed by one end of a cylindrical plug, said plug having at least one longitudinally extending peripheral gas-vent groove, the other end of said plug having a cylindrical projection telescoped with respect to one end of an intermediate tube, said connecting tube and said intermediate tube and the plug each being surrounded by a protective tube telescoped onto said head piece and in contact with said collar, the inside diameter of said protective tube being substantially equivalent to the outside diameter of the plug and said cylindrical body, the interior of said connecting tube being vented for escape of gases to the chamber between said protective tube and said intermediate tube by way of said groove, said cylindrical body having a central bore and at least one other bore generally parallel thereto, said central bore at said one end of the body receiving a supply tube for said sample container, said additional bore being shorter than the length of said



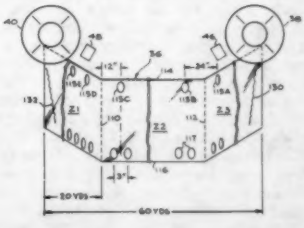
body and having a radially disposed exit port at theouter perphery of said body, said cylindrical body having a slot coextensive with said central bore and receiving said sample container, an electrical contact device supported within said intermediate tube and electrically coupled to said measuring device, and a spacer at the other end of said intermediate tube, said spacer being provided with means to vent gases from said chamber.

4,401,390

RIBBON CONTROL SYSTEM FOR MULTIPLE COLOR IMPACT PRINTER

Raymond F. Melissa; Lorne H. Grummett, both of Costa Mesa, and Joseph J. Fischer, Santa Ana, all of Calif., assignors to Trilog, Inc., Irvine, Calif.

Division of Ser. No. 31,076, Apr. 18, 1979, Pat. No. 4,289,069.
This application Oct. 27, 1980, Ser. No. 201,135
Int. Cl.³ B41J 33/02
U.S. Cl. 400—240.3 6 Claims



1. A control system, useful in a printer apparatus having means for mounting a ribbon for bidirectional movement along a path through a print station, for moving selected zones of the ribbon into said print station, said system comprising:

an elongated ribbon incuding at least first, second, and third contiguous zones of different colors arranged end to end along the length of said ribbon;

a first plurality of binary marks on said ribbon aligned along

the direction of ribbon elongation, said marks arranged in uniquely encoded groups, each group being located proximate to a boundary between a different pair of contiguous zones and including at least first and second binary marks spaced by a distance D;

sensor means mounted adjacent to said ribbon path for sensing said binary marks;

said sensor means including first and second sensors fixedly mounted adjacent to said ribbon path, each operable to produce an output signal when one of said binary marks moves therepast, said first and second sensors being aligned and spaced along said ribbon path by a distance different from D whereby all of said marks will move past and be sensed by both said first and second sensors and the sequence of output signals produced by said sensors will indicate the direction of movement of said ribbon; and

logic means responsive to said sensor means for identifying the particular ribbon zone in said print station.

4,401,391

SERIAL PRINTER

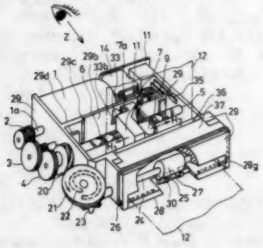
Jun Kawai, Hirakata, and Akira Katsura, Amagasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 24, 1981, Ser. No. 257,133

Claims priority, application Japan, Apr. 28, 1980, 55-56863; Apr. 28, 1980, 55-58999[U]; May 2, 1980, 55-61099[U]; May 2, 1980, 55-61100[U]; May 2, 1980, 55-61101[U]; May 2, 1980, 55-61102[U]

Int. Cl.³ B41J *3/04*

U.S. Cl. 400—120 **12 Claims**



1. In a serial printer of the type including a frame means having a paper moving means thereon for intermittently moving a recording paper relative to a printing position to bring a new part of the paper to said printing position, a head holder movably mounted on guide means disposed on said frame means, a motor and gear means for respectively driving said paper moving means and said head holder, said head holder supporting a printing head having a printing element which faces the recording paper in said printing position said printing head along a path of travel substantially widthwise of the recording paper traversing said printing position, said head holder having a head pressing means for pressing said head onto the surface of the recording paper at least during a period of printing and for releasing said head at least during the movement of the recording paper, the improvement comprising:

said head pressing means including a lever pin carried by said head holder and movable between a clamped and unclamped positions on said head holder, a pressing member mounted on said head holder for constantly urging said lever pin and printing head away from each other whereby an end of said lever pin engages a surface of said frame means and said printing head presses against the recording paper when said lever pin is in said unclamped position, locking means on said lever pin and head holder for locking said lever pin in said clamped position wherein said printing head stops pressing against the recording paper, first and second cam means mounted on said frame means, each at one end of the path of travel of said printing head, said first cam means being engageable by a portion of said lever pin to move said locking means to a locked position to thereby move said lever pin to said clamped position, said second cam means being engageable by said portion of said lever pin to release said locking means to thereby move said lever pin to said unclamped position.

4,401,392

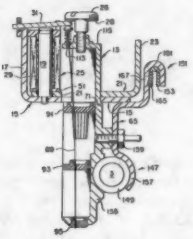
DOT MATRIX PRINT HEAD

James E. Blomquist, and Robert H. Wilczewski, both of 203 E. Main, Riverton, Wyo. 82501

Continuation of Ser. No. 256,032, Apr. 21, 1981, abandoned, which is a division of Ser. No. 38,724, May 14, 1979, Pat. No. 4,279,518. This application Sep. 28, 1982, Ser. No. 425,255

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **23 Claims**



1. In a dot matrix print head having a plurality of print wires with impact ends and print ends wherein said print wires are supported in a wire guide assembly with the impact ends thereof positioned in a predetermined pattern about an axis, the improvement comprising:

a plurality of individual coil assemblies, each coil assembly including a bobbin member, coil member, and clapper member, said bobbin member having first, second, and third portions, said first portion having an open-ended, hollow shape, said coil member being positioned about said first portion and said bobbin member having means for retaining said coil member about said first portion, said second and third bobbin member portions being attached to and extending outwardly of said first portion and having means for mounting said clapper member therebetween for movement relative to said bobbin member, and said second portion further having an alignment slot therethrough of a predetermined size and shape, and

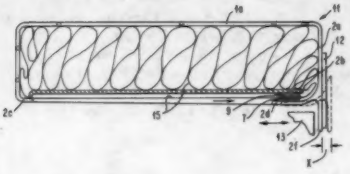
means for supporting each of said coil assemblies in a predetermined alignment with said wire guide assembly with a portion of each clapper member of each coil assembly in contact with a different one of the impact ends of said print wires, said support means including a plurality of pole pieces, each of said pole pieces being slideably receivable within one of said first hollow portions of said bobbin members, means for mounting said pole pieces in a predetermined, fixed relationship to said wire guide assembly, a plurality of alignment members having end portions with configurations substantially corresponding in size and shape to said alignment slots and being slideably receivable therein, and means for mounting said plurality of alignment members in a predetermined, fixed relationship to said wire guide assembly and said pole pieces whereby each respective coil assembly can be positioned to receive one of said pole pieces in the first portion of said bobbin member and to receive the end portion of one of said alignment members in the alignment slot of the second portion of said bobbin member with the clapper member thereof in contact with the impact end of one of said print wires.

4,401,393

PRINTER RIBBON CASSETTE AND FEED MECHANISM

Douglas E. Alexander, and Charles M. McCray, both of Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,009
Int. Cl.³ B41J 35/28
U.S. Cl. 400—208 7 Claims



1. A printer ribbon cassette and ribbon feed combination, comprising:

a cassette ribbon housing comprising generally continuous and conjoined top, bottom and side walls, said side walls having at least an exit and an entrance opening therein for withdrawing ribbon from the interior of said cassette and for reinserting said ribbon therein;

one of said side walls being unconnected to the top and bottom walls and attached to the remaining side walls at only one end to be freely flexible in bending about its attachment to the remaining side walls, the remainder of said side walls being connected to the top and bottom walls and to each other;

first frictional drive means mounted in contact with said ribbon and affixed to one end section of said one side wall at the end opposite to the end which is connected to the remaining side walls;

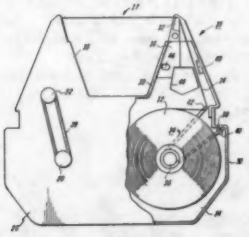
said one end section of said side wall section being flexed and released to move said first frictional drive means along the desired line of travel of said ribbon to withdraw said ribbon from said cassette housing.

4,401,394

UNIVERSAL END OF RIBBON SENSING SYSTEM

James G. Hume, San Ramon; John Sidvers, Pleasanton, and Harold S. Foster, Fremont, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 13, 1981, Ser. No. 310,556
Int. Cl.³ B41J 32/00, 35/36
U.S. Cl. 400—208 7 Claims



1. A ribbon cartridge having a top cover section, a bottom cover section, a peripheral sidewall section connecting said top and bottom cover sections, a ribbon supply means providing a length of ribbon, ribbon take-up means, and ribbon drive means for drawing ribbon from said supply means for collection by said take-up means, characterized by including universal end of ribbon indicating means comprising:

aperture means in said bottom cover section for allowing penetration into the interior of said ribbon cartridge by a plurality of spaced sensing means;

means for directing said ribbon for movement in a path of travel adjacent said aperture means;

reflecting means located on said ribbon near the end of its length, for use in cooperation with one of said sensing means;

transparent means located on said ribbon near the end of said ribbon length, for use in cooperation with others of said sensing means; and

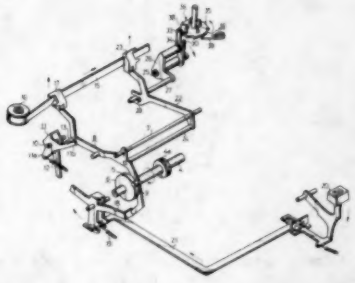
reflector means having a first reflective portion for use in cooperation with a first of said others of said sensing means and having a second reflective portion for use in cooperation with a second of said others of said sensing means, said reflector means being positioned on the side of said ribbon remote from said sensing means.

4,401,395

TYPEWRITER

Hisao Kurachi, Okazaki; Takeo Ito, Kuwana, and Hiroshi Onoda, Kariya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Feb. 26, 1981, Ser. No. 238,552
Claims priority, application Japan, Feb. 27, 1980, 55-23840
Int. Cl.³ B41J 29/42
U.S. Cl. 400—697.1 3 Claims



1. A typewriter wherein a printing element strikes through a ribbon against a record medium mounted on a platen, and a ribbon drive mechanism drives said ribbon in response to operation of said printing element both longitudinally and transversely relative to a point of contact between said printing element and platen, said mechanism comprising:

a pair of spindles on which spools containing said ribbon may be mounted,

a drive member movably mounted about one of said spindles for driving thereof in one rotational direction and thereby advancing increments of said ribbon,

a cam fixed on a shaft rotated on each operation of said print element, the periphery of said cam including a smallest radius portion and a largest radius portion,

a vibrator pivotally mounted and having a guide portion for guiding said ribbon and a cam follower engageable to the periphery of said cam for shifting said guide portion between a normal rest position and an elevated operative position at which said guide portion holds said ribbon to be struck by said printing element,

a spring member for resiliently urging said vibrator to bias said cam follower toward said cam and to raise said guide portion by its resilient force from said rest position to said operative position when said cam is rotated between positions at which said largest radius portion and said smallest radius portion engage with said cam follower according to rotation of said cam, said guide portion being lowered to said rest position when said cam is rotated between positions at which said smallest radius portion and said largest

radius portion engage with said cam follower against the force of said spring member, whereby raising of said vibrator is caused by said spring member and lowering of said vibrator is positively caused by engagement of said cam with said cam follower, and

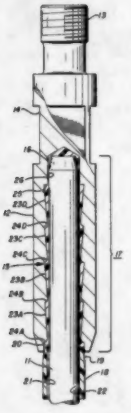
means for coupling said vibrator to said drive member in order to advance increments of said ribbon when said guide portion is lowered to said rest position from said operative position according to rotation of said cam.

4,401,396

FIBERGLASS OIL WELL SUCKER ROD

Angus T. McKay, 1105 D'Amico Dr., Chicago Heights, Ill. 60411

Filed Feb. 23, 1981, Ser. No. 236,664
Int. Cl.³ F16B *11/00*
U.S. Cl. 403—13 **4 Claims**



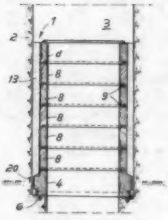
1. A fiberglass sucker rod for well strings in a well such as an oil well including: a fiberglass rod cut to length; fittings each with a rod end receiving opening mounted on opposite ends of said fiberglass rod; said rod end receiving openings in said fittings having a successive positioned plurality of tapered annular pockets; space between a rod end and the walls of said rod end receiving opening being filled by a hardened bonding matter, formerly in fluid form at time of rod end to fitting assembly; and said hardened bonding matter forming tapered annular wedges each bonded to said rod and generally in the shape of the respective tapered pockets forming molds for the bonding matter contained therein as it hardens to the solid state; and with the tapered annular pocket and the tapered annular wedge contained therein closest to the rod entrance end of said fitting opening having a more shallow taper than the taper of following tapered pockets and the tapered annular wedges contained therein; wherein the outer diameter of the fiberglass rod throughout the distance of said successively positioned plurality of tapered annular pockets is of less diameter than the minor diameter of each of said successively positioned plurality of tapered annular pockets; and with said annular tapered wedges interconnected by hardened bonding matter; each of said successively positioned plurality of tapered annular pockets at the minor diameter thereof has an annular radiused entrance tangential to the angle of the taper of the pocket to relieve stress in hardened bonding matter shaped thereby; centering means contributes to properly centered alignment between the rod and fitting through each rod to fitting interconnect; said centering means includes a centering ring seated in an annular shoulder at the rod entrance of said fitting opening; said centering ring projects for a protective distance from the rod end of the fitting to protect from tool impact damage; and, wherein said centering ring is provided with a bonding agent relief passage to receive excess flow of bonding agent in the fluid form as a rod end and fitting are assembled together.

4,401,397

METHOD AND DEVICE FOR INSTALLING A SHAFT LINING IN SHAFTS THROUGH AN AQUIFEROUS FORMATION

Albrecht Sommer, Mülheim-Ruhr, and Heinrich Sparenberg, Bottrop, both of Fed. Rep. of Germany, assignors to Gewerkschaft Walter, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,555
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3014027
Int. Cl.³ E21D *5/00, 11/00*
U.S. Cl. 405—133 **10 Claims**



1. A method of lining a bore shaft extending through an aquiferous formation comprising:

boring the bore shaft through the aquiferous formation to form a shoulder below a lower boundary of the aquiferous formation;

detachably connecting a plurality of guide and alignment columns to a base ring;

lowering the base ring and plurality of columns into the bore shaft to seat the base ring on the bore shoulder;

centering the base ring and columns in the bore shaft;

subsequently lowering and guiding one lining ring at a time on the column into the bore shaft and onto one of the base rings and a previously-lowered lining ring to form a sealing joint therewith, the base ring and lining rings stacked to form a lining tube in the bore shaft; and

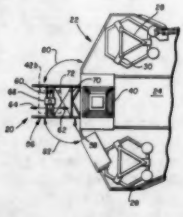
forming each of the lining rings and base ring to have watertight tongue and groove sealing joints therebetween.

4,401,398

SUPPORT STRUCTURE FOR MUDLINE SUSPENSION WELLHEAD

Donald R. Remson, Houston, Tex., assignor to Western Services International, Inc., Houston, Tex.

Filed May 26, 1981, Ser. No. 266,967
Int. Cl.³ E02B *17/00*; E02D *21/00*
U.S. Cl. 405—201 **19 Claims**



1. A structure for attachment to an offshore drilling platform

for supporting the freestanding portion of a mudline suspension wellhead comprising:

first and second support arms attached to and extending from the platform, said arms being independently hingeable from said platform and movable from a stored position against said platform to a working position extending from said platform,

a gantry supported by and slidable relative to said arms when said arms are in the working position,

a cradle structure mounted for lateral movement on said gantry,

means for positioning said gantry along the longitudinal length of said arms when said arms are in the working position and for positioning said cradle along the longitudinal length of said gantry to selectively align said gantry and cradle structure relative to the wellhead, and

means associated with said cradle structure for clamping said wellhead.

4,401,399

TWO PART MINE ROOF SUPPORT UNIT

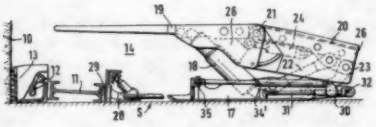
Kunibert Becker, Werl; Burckhard Elsner, and Gerd Dunkel, both of Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,034

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024465

Int. Cl.³ E21D *23/00*

U.S. Cl. 405—299 **17 Claims**



7. A longwall mineral mining installation, comprising: a longwall structure extending along a longwall working, and first and second sets of roof support units positioned side-by-side along the goaf side of the longwall structure, wherein the roof support units of the first set each comprise two detachably connected parts (A, B), each part having a floor girder (17), and a roof bar (19) supported above the floor girder by hydraulic prop means (18), said first set of roof support units being positioned at one end of the working, wherein each roof support unit part includes an advance mechanism (S), the advance mechanisms being detachably secured to the longwall structure and being detachably secured to their respective roof support unit parts.

4,401,400

MACHINE TOOL

Gerhard Stark, Beethovenstr. 21, 7312 Notzingen, Fed. Rep. of Germany

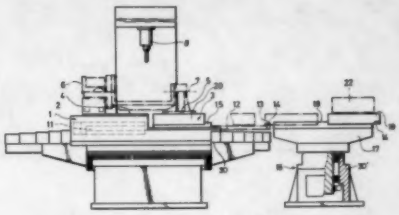
Filed Sep. 19, 1980, Ser. No. 188,596

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940822

Int. Cl.³ B23G *11/00*; B23Q *3/00, 7/00*

U.S. Cl. 408—71 **7 Claims**

1. A machine tool comprising a coordinate work table unit; means supporting said table unit for movement in a horizontal plane; means for moving a processing tool in vertical directions relative to said table unit; said table unit including a fixed base part and guiding means for engaging and guiding an exchangeable part which is movable relative to the base part, said base part and said exchangeable part having each an upper surface levelled in one plane for supporting and clamping a workpiece, a pallet changer arranged at a fixed position relative to said work table unit, said pallet changer being provided with additional guiding means arranged at the level of said first mentioned guiding means for engaging and guiding at least two



exchangeable parts, and means disconnectably engaging and displacing an exchangeable part between said work table unit and said pallet changer and vice versa.

4,401,401

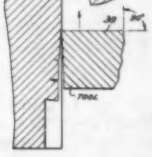
METHOD AND APPARATUS FOR BROACHING

Robert E. Roseliep, Grosse Pointe Woods, Mich. 48236

Filed Sep. 8, 1981, Ser. No. 299,778

Int. Cl.³ B23D *37/00*

U.S. Cl. 409—244 **3 Claims**



1. A process of broaching a formed part for a predetermined distance from the end of the part in a series of cuts with individual broaching teeth, which comprises moving the part relative to said series of teeth to cut progressively deeper into said part with each tooth, said cuts terminating at an uninterrupted surface of the part in progressively decreasing lengths to cause the chips of said progressive cuts to project radially and stack up axially in close proximity to each other, and shearing said chips simultaneously from said part with a final tool pass which contacts only the chips.

4,401,402

LIQUID SEAL LOCK HOPPERS AND METHOD OF UTILIZING SAME

John R. Casperson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 16, 1981, Ser. No. 273,558

Int. Cl.³ B65G *53/30*; B01J *8/08*

U.S. Cl. 414—218 **30 Claims**

1. Apparatus comprising:

(a) a first sealable vessel having an inlet and an outlet;

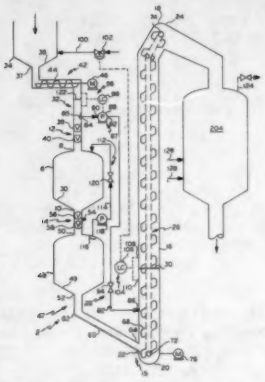
(b) a first valve means associated with the inlet of the first sealable vessel;

(c) a second valve means associated with the outlet of the first sealable vessel;

(d) an elevator housing having an inlet and an outlet, with the outlet of the elevator housing being positioned above the inlet of the elevator housing, with the outlet of the first sealable vessel being in flow communication with the inlet of the elevator housing;

(e) a means cooperating with the elevator housing for selectively conveying a particulate material from the inlet of the elevator housing to the outlet of the elevator housing; and

(f) a means for maintaining a liquid level in said elevator



housing between the inlet of the elevator housing and the outlet of the elevator housing, said means for maintaining a liquid level comprising a first conduit means bypassing the first sealable vessel and establishing a flow path between the inlet of the first sealable vessel and the elevator housing.

4,401,403

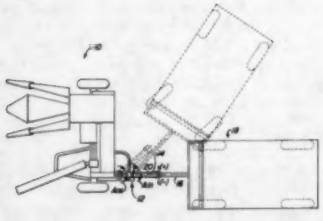
SPOUT CONTROL SYSTEM

Stanley J. Johnson, Cedar Falls; David T. Allen, and Keith R. Baker, both of Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 13, 1981, Ser. No. 282,364

Int. Cl.³ B65G 67/22

U.S. Cl. 414—335 **19 Claims**



1. In an automatic control system for maintaining a predetermined spout-wagon angular relationship in an apparatus comprising a crop discharge spout on an agricultural machine and a crop-receiving wagon pivotally attached to the machine, the improvement comprising:

means for automatically maintaining the spout-wagon angular relationship within a first angular range for each wagon-machine angle of one range of wagon-machine angles; and

means for automatically maintaining the spout-wagon angular relationship within a second angular range for each wagon-machine angle of another range of wagon-machine angles.

4,401,404

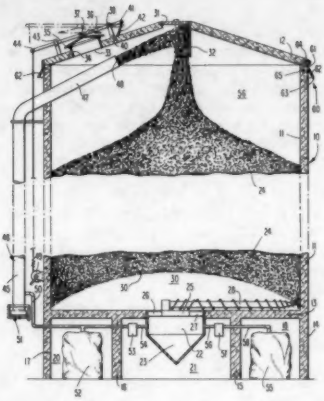
SILO STRUCTURE

Richard L. Weaver, R.D. #4, Myerstown, Pa. 17067

Continuation of Ser. No. 41,304, May 22, 1979, abandoned. This application Mar. 3, 1982, Ser. No. 354,523

Int. Cl.³ A01F 25/16

U.S. Cl. 414—292 **4 Claims**



1. In a storage silo for agricultural products and the like, being sealed from the outside environment, wherein the silo is of the type designed for storage of silage for substantial periods without aeration, and in which there is reduced oxygen content, relatively high heat, and relatively high humidity, and wherein materials may be stored without danger of oxidation, having an upstanding wall and a roof on its upper end, wherein the silo is of the bottom unloader type having unloader means at the lower end of the silo for unloading silage therefrom, conduit means communicatively connecting the upper and lower inner ends of the silo, for substantially equalizing pressure in the silo above and below silage located therein, the conduit means allowing free flow of gas in either direction within the conduit means,

said conduit means comprising a fill pipe for delivering agricultural products into the top of the silo,

wherein said conduit means traverses the silo between its upper and lower ends, outside the silo, the conduit means at its upper end being free of any closure preventing communication between the conduit means and the top of the silo; the conduit means also including a vent line communicatively interconnecting the lower end of the conduit means and the bottom of the silo; the conduit means being sealed against communication with the environment outside the silo,

including sealing closure means at the lower end of the conduit means for sealingly closing off access to the conduit means when the conduit means is not in use as a delivery means, the sealing closure means thereby comprising means for maintaining the oxygen content of the interior of the silo at a substantially reduced level relative to atmospheric conditions, with said sealing closure means being arranged for sealing the lower end of the conduit means, said vent line being connected to said lower end of said conduit means,

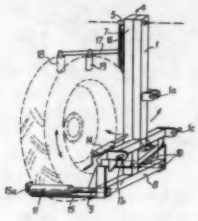
including at least one gas expansion bag for receiving silage gases therein, said bag being in communicative connection with said upper and lower ends of the silo through said vent line.

4,401,405

HANDLING DEVICE FOR FACILITATING THE CHANGING OF VEHICLE WHEELS, NOTABLY OF AGRICULTURAL TRACTORS AND TRUCKS

Pierre M. Ealet, Paris, France, assignor to Societe Anonyme d'Attelages Lemoine, Reims, France

Filed Dec. 19, 1980, Ser. No. 218,439
Claims priority, application France, Dec. 21, 1979, 79 31417
Int. Cl.[3] B60B *29/00*
U.S. Cl. 414—428 15 Claims



1. A handling device for dismounting and remounting wheels, said device comprising:

first and second frame members pivotally interconnected along an axis, said second frame member having means for carrying a wheel such that the wheel axis and the pivot axis interconnecting said frames extend in the same direction and are in substantially vertical alignment;

means for pivoting said second frame member back and forth about the pivot axis interconnecting said frames to move the axis of the wheel into and out of vertical alignment with said pivot axis; and

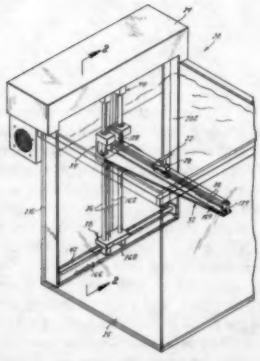
means for holding said first frame member to permit said second frame member to pivot relative thereto.

4,401,406

REMOTE THREE AXIS CABLE TRANSPORT SYSTEM

Miguel Rovira, 3954 Hartford, St. Louis, Mo. 63116

Filed Oct. 31, 1980, Ser. No. 202,724
Int. Cl.[3] B66F *11/00*; F16H *7/16*
U.S. Cl. 414—589 12 Claims



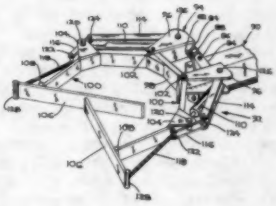
1. A system for accurately positioning a probe at any preselected point in a three dimensional space comprising: a probe, means defining a bounded three dimensional space including a support, said support having at least one guide bar extending along each of three directions of movement, and a guide block supported on each of said guide bars, said probe being mounted to one of said guide blocks, said system having means for selectively moving said probe in a plurality of directions including a cable drive for moving said probe in each movable direction, each of said cable drives including a motor and a cable means associated therewith, said cable means extending between said drive motors, guide blocks, and said support, each drive motor and cable means having a capstan associated therewith, each of said drive motors being in driving relation to its associated capstan, each cable means including at least one cable wrapped at least partially around its associated capstan so that rotation of a capstan by a drive motor causes said cable to move at least one guide block along its associated guide bar and thereby move the probe, and wherein a sub-assembly mounts the drive motors and capstans for two directions of movement, said sub-assembly being supported from at least one of said guide bars for said third directions of movement, said third motor for the third direction of movement and its associated capstan and drive cable having means to move said sub-assembly along its associated guide bar.

4,401,407

GRASPING APPARATUS AND COLLECTION VEHICLE

David L. Breckenridge, P.O. Box 623, Monroe, Iowa 50170

Filed Nov. 14, 1979, Ser. No. 94,075
Int. Cl.[3] B65F *3/06*
U.S. Cl. 414—408 18 Claims



8. A grasping device comprising in combination a frame, extensible power means, and a plurality of arm members connected to said frame, at least one of said arm members comprising

an inner arm having first and second ends, said inner arm being pivoted at the first end in said connection to said frame;

an outer arm having an inner end and an outer end, said outer arm being pivoted intermediate said inner and outer ends to the second end of said inner arm; and

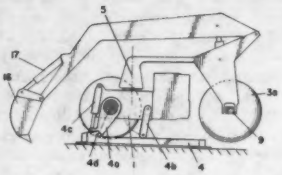
linking means comprising a first link, a middle link, and a second link, each of said links having first and second ends, said middle link first end being pivoted to said first link second end and said middle link second end being pivoted to said second link first end, said first link first end being pivoted to said frame and said second link second end being pivoted to said inner end of said outer arm, said middle link being pivoted to said inner arm intermediate said first and second ends of said inner arm and intermediate said first and second ends of said middle link,

said grasping device having said extensible power means pivoted to said at least one said arm member and pivoted to said grasping device so as to move said at least one said arm member graspingly relative to the rest of said plurality of arm members.

4,401,408
ARTICULATED VEHICLE

Pierre Gibert, Saint-Cerques, F-74170 Douvaine, France

Filed Aug. 6, 1981, Ser. No. 290,463
Claims priority, application France, Aug. 14, 1980, 80 18027
Int. Cl.³ E02F 3/75
U.S. Cl. 414—687 2 Claims



1. An articulated vehicle, comprising:

(a) a first frame assembly including a first pair of ground engaging wheels, and including a vertical pivot fixed to the first frame and extending upwardly therefrom;

(b) a rigid beam having a first end carrying bearing means journalled on said pivot and the beam extending from its first end located at the pivot, above said first frame assembly, to a second end located horizontally beyond the first frame assembly;

(c) a second frame assembly including a frame member fixed to the second end of the beam and carrying a pair of ground engaging wheels, the frame member being carried by the beam in a position located horizontally beyond the first frame assembly thereby to permit the beam and the second frame assembly to be rotated about said pivot relative to said first frame assembly;

(d) a boom pivotally supported above the wheels of said second frame member for tilting about a horizontal axis, and means to raise and lower the boom about said axis;

(e) a ground engaging support frame, means connecting the support frame with said first vehicle frame assembly, and means operative for selectively displacing the frame to a raised position in which it is elevated above the ground and said pairs of wheels support the vehicle on the ground and operative for selectively displacing the support frame to a lowered position in which it entirely supports the vehicle with said pairs of wheels elevated off the ground; and

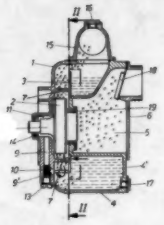
(f) means for rotating the beam and the second frame assembly about the vertical pivot and the first frame assembly to permit a full 360° of rotation of the second frame assembly about the first frame assembly.

4,401,409
SELF-PRIMING CENTRIFUGAL PUMP

Ratko Torbica, and Vladimir Bertok, both of Koper, Yugoslavia, assignors to Tovarna Motornih Vozil Tomos Koper, n.sol.o., Koper, Yugoslavia

Filed Oct. 22, 1980, Ser. No. 199,435
Claims priority, application Yugoslavia, Oct. 22, 1979, 2554/79
Int. Cl.³ F01D 1/02, 9/00
U.S. Cl. 415—211 9 Claims

1. A self-priming centrifugal pump comprising a housing enclosing a cavity, a rotor positioned in said cavity and having a hub, means for rotatably supporting said hub of said rotor, a stator consisting of spirally shaped guide vanes overlapping each other so as to form first and second spiral divergent channels positioned in said housing and surrounding the periphery of said rotor, a suction port connectable to a suction pipe for introducing fluid into said cavity, a flap valve positioned to close said port, the guide vanes of the stator extending in an axial direction over the peripheral width of the rotor towards the suction side of the pump, the rear side of the rotor and the hub being placed into the cavity, a passage formed in the lower part of the housing, and a third channel communicating with said passage, said passage being located downstream of an end portion of one of said guide vanes, with respect to the direction of rotation of the rotor, and establishing communication between one of said divergent channels and said third

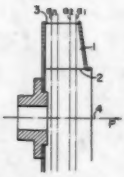


channel, said third channel receiving fluid through said passage and communicating with a portion of the cavity containing said rotor to thereby return fluid directed away from said rotor by said one of said guide vanes to the periphery of said rotor.

4,401,410
DIAGONAL-FLOW FAN WHEEL WITH BLADES OF DEVELOPABLE SURFACE SHAPE

Yoshiyasu Nishikawa, Ono, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Division of Ser. No. 918,556, Jun. 23, 1978, Pat. No. 4,274,810.
This application Dec. 8, 1980, Ser. No. 214,290
Claims priority, application Japan, Jun. 29, 1977, 52-78168; Jul. 1, 1977, 52-79309
Int. Cl.³ F04D 29/28
U.S. Cl. 416—186 R 2 Claims



1. A fan wheel of a diagonal-flow fan for propelling a flow of a gas, said fan wheel comprising a rotational shaft; frustoconical main plate (16) coaxially fixed to the shaft, a frustoconical side plate (17) coaxially fixed with respect to the axis (14) of rotation of the shaft and spaced apart from the main plate to form therebetween a diagonal flow path for the gas, the cone angle of the main plate (16) being greater than the cone angle of the side plate (17), and a plurality of fan blades (11) each fixed at respective opposite side edges to the inner surfaces of the main and side plates (16,17) and having an inner entrance part and an outer exit part, said parts extending substantially transverse to said diagonal flow path, each of said fan blades (11) comprising a plate of a surface shape conforming to a portion of a combination of two cylindrical surfaces (29,30) joined to each other along a straight joining line (m_{21}–m_{2n}) in an algebraically and geometrically continuous manner, said portion being formed of elements constituted by mutual intersection lines between said cylindrical surfaces (29,30) and successive coaxial conical surfaces (15_{11} 15_{21} . . . 15_{n1}) varying between said conical surfaces of said main and side plates, said coaxial conical surfaces progressively diminishing in cone angle from said main plate to said side plate and having a common axis (H) coinciding with said axis (14) of rotation of

the shaft, said straight joining line (m_{s1-m1n}) and the common axis (H) lying in a common plane (V,W) and forming an angle (K) therebetween.

4,401,411

DEVICE FOR CONNECTING TURBINE BLADES

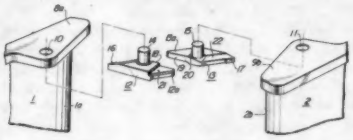
Katsukuni Hisano; Kazuo Ikeuchi; Makoto Nishimura; Hazime Sibaoka, all of Hitachi; Kiyoshi Namura, Ibaraki; Akira Isida, and Katsumi Oyabu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,599

Claims priority, application Japan, Jun. 4, 1980, 55-74367

Int. Cl.³ F01D *5/22, 25/04*

U.S. Cl. 416—196 R **13 Claims**



1. A device for connecting adjacent turbine blades in a turbine characterized by comprising: a plate-shaped member provided at the radially outer end of each turbine blade and extending substantially at a right angle to the longitudinal plane of said turbine blade and projected from the leading edge and the trailing edge of said turbine blade; and a plurality of connecting members adapted to engage said plate-shaped members, one of said connecting members engaging said plate-shaped member projecting from the leading edge of one of said turbine blades while the other connecting member engages said plate-shaped member projecting from the trailing end of an adjacent turbine blade, said connecting members being so arranged that they partly lap said plate-shaped members of the adjacent turbine blades, sad connecting members being adapted to contact with each other during rotation of the turbine wheel to mechanically connect the adjacent turbine blades of said turbine.

4,401,412

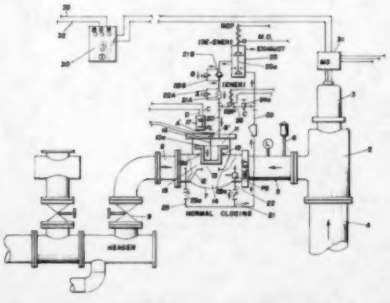
HEAVY DUTY ELECTRIC PUMP CONTROL UNIT

Louis E. Salina, and Joseph E. Lescovich, both of Bridgeville, Pa., assignors to GA Industries Inc., Mars, Pa.

Filed Jun. 1, 1981, Ser. No. 268,673

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—12 **10 Claims**



1. For use in a pumping station where an electrically driven pump with a current supply circuit transfers large volumes of liquid, hereinafter termed "water", from a supply source into a main against the static pressure in the main and/or the concurrent output of other pumps into the same main, wherein there is a check valve between the pump and the main for preventing backflow of water from the main into the pump when the pressure at the pump outlet is lower than the pressure in the main, the check valve opening and closing under normal conditions by a normal solenoid pilot valve (NSP), but under an emergency condition by an emergency solenoid pilot valve (ESP), the check valve having a limit switch (LSR) which normally closes when the pump is not operating but which, under the operation of the pump at start-up, opens said normally closed start-up position and closes a second circuit which then sustains the operation of the pump as long as the pump continues to operate normally but which, upon a lowering of the pump pressure to a level where the line pressure in the main is higher than the pump output pressure to said pump start-up position, the improvement comprising:

(a) a pump director unit having a two-wire circuit connected with the current supply circuit to the pump whereby the pump director is primarily controlled only if the electric current supply line is energized;

(b) said two-wire circuit of the pump director unit having a hand-operated switch HOA through the closing of which the unit is energized, the unit having:

(1) a valve delay relay, VDR,

(2) a valve delay timer, VDT,

(3) a motor starting relay, through the energizing of which a starter for the pump motor will be energized,

(4) a first electric lightbulb (B),

(5) a second electric lightbulb (R),

(6) a flasher circuit between HOA and B,

(7) a parallel circuit to lightbulb B shunted around the flasher circuit;

(8) said parallel circuit comprising a connection between the unit and a pressure activated switch between the pump and check valve;

(c) said circuit and relays being so connected that when HOA is closed, VDT will be energized to close relay VDR, the closing of which energizes MSR to start the pump motor, the closing of VDR connecting the lightbulb B into the flasher circuit, causing it to flash indicating that the pump starting circuit is proceeding normally, and if the pressure switch builds up pressure at the pump outlet before VDT times out, said parallel circuit between HOA and bulb B will close and VDR will be de-energized to open the flasher circuit;

(d) said HOA, VDT, and VDR circuits being such that if the pressure switch on the pump outlet has not reached a predetermined pressure when VDT times out and VDR opens, a circuit will then be closed from the flasher through de-energized VDR to said second bulb R, indicating by the flashing of R that the pump has lost suction or failed to operate in some other respect, thereby signaling an attendant to open HOA.

4,401,413

AIR COMPRESSOR SWITCH DEVICE

Willie G. Dickens, 110 Blackstone Pl., Nashville, Tenn. 37211

Filed Jun. 8, 1981, Ser. No. 271,676

Int. Cl.³ F04B *49/02, 49/08*

U.S. Cl. 417—26 **4 Claims**

1. In an air compressor plant having an air receiver tank, an electrically-driven air compressor, including an unloader valve mechanism, for supplying compressed air to the receiver, and an electrical supply circuit, a switch device comprising:

(a) an air outlet line in fluid communication with the receiver,

(b) air valve means having a valve inlet in fluid communication with said air outlet line, and a valve outlet,

(c) pneumatic valve actuator means comprising a trigger lever operatively connected to said air valve means for opening and closing said air valve means,

(d) an air chamber having a movable wall,

(e) link means connecting said movable wall to said trigger lever,

(f) a branch air line connecting said air chamber in fluid

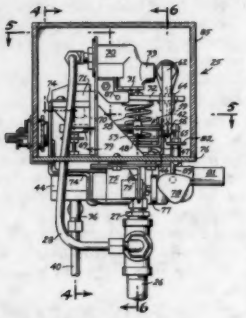
communication with said air outlet line, whereby said trigger lever is operable to open said air valve means when the air pressure in said air outlet line exceeds a predetermined value,

(g) a main switch in the main drive circuit,

(h) a capacitor switch in each of the capacitor circuits,

(i) pneumatic switch actuator means for opening and closing said main switch and said capacitor switch, simultaneously,

(j) said pneumatic switch actuator means being in fluid communication with said valve outlet, so that when said air valve means is open, said pneumatic switch actuator means opens said main switch and each said capacitor,



(k) an unloader control air line in fluid communication with the unloader valve mechanism and said valve outlet,

(l) a relief valve device in said unloader control air line operative between a closed position when said air valve means is open, and an open position exhausting said unloader control air line when said air valve means is closed,

(m) said unloader control air line also being in fluid communication with said pneumatic switch actuator means,

(n) an auxiliary switch in the main drive circuit having a reciprocal switch actuator member for opening said auxiliary switch, and

(o) manual actuator means for moving said switch actuator member to open said auxiliary switch.

4,401,414

SWASH-PLATE TYPE COMPRESSOR HAVING A SIMPLE LUBRICANT OIL FEEDING ARRANGEMENT

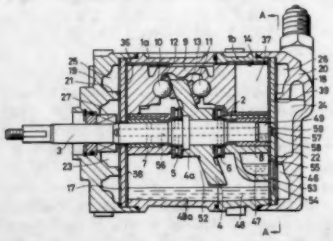
Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,394

Claims priority, application Japan, Aug. 30, 1980, 55-120239

Int. Cl.³ F04B *39/02, 1/18*

U.S. Cl. 417—269 **11 Claims**



1. In a swash-plate type compressor, the combination comprising:

a cylinder block having at least one cylinder bore axially extending therethrough, a through bore extending along an axis thereof, and a first oil reservoir chamber formed therein at a bottom portion thereof;

a drive shaft rotatably fitted in said through bore of said cylinder block, said drive shaft having an oil feeding bore extending along an axis thereof;

a swash plate secured on said drive shaft;

at least one piston slidably received within said at least one cylinder bore, said piston defining a fluid pumping chamber in cooperation with said cylinder bore;

an oil pumping chamber permanently communicating via a communication passage with said fluid pumping chamber, said oil pumping chamber being supplied with pressure in said fluid pumping chamber which varies in response to a change in the volume of said fluid pumping chamber;

a second oil reservoir chamber communicating with said oil feeding bore of said drive shaft;

a first oil feeding passageway communicating said oil pumping chamber with said first oil reservoir chamber;

a second oil feeding passageway communicating said oil pumping chamber with said second oil reservoir chamber;

a first valve responsive to a change in the pressure within said oil pumping chamber to open and close said first oil feeding passageway to control supply of lubricant oil solely from said first oil reservoir chamber to said oil pumping chamber; and

a second valve responsive to a change in the pressure within said oil pumping chamber to open and close said second oil feeding passageway to control supply of lubricant oil solely from said oil pumping chamber to said second oil reservoir chamber.

4,401,415

HYDRAULIC PRESSURE TRANSFORMER

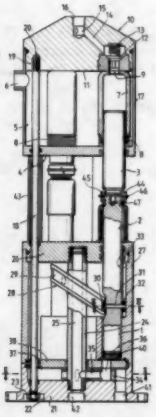
Paul Hammelmann, Zum Sundern 17, 4740 Oelde 1, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 253,146

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014552

Int. Cl.³ F04B *1/18, 17/00, 35/00*

U.S. Cl. 417—270 **10 Claims**



1. A hydraulically driven axial piston pump of the type having a driving part including at least three cylinder-and-piston units, a driven part including a suction chamber provided with suction valves and pressure valves for a driven medium, at least three plungers arranged in alignment with respective pistons of the cylinder-and-piston units and being coupled thereto by means of piston rods, said plungers cooperating with said suction valves and said pressure valves to suck or

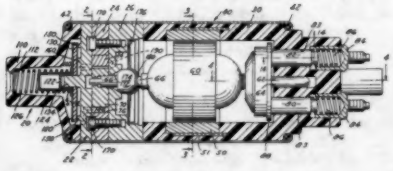
discharge a driven medium into and from said suction chamber, said driving part comprising a first end plate arranged in the range of said piston rods and being provided with guiding openings for said piston rods, a second end plate arranged in axially spaced relationship to said first end plate and being provided with a central intake port and with an eccentric discharge port for admitting and releasing a driving medium, and an intermediate partition arranged between said end plates and defining with said second end plate an interspace, said intermediate partition being formed with a center opening and with eccentric openings communicating with respective cylinder-and-piston units, a rotary tubular member passing through the center opening of said intermediate partition and being supported for rotation between the two end plates, said tubular member defining an axial bore communicating with the central intake port said second end plate, a wobble disk rigidly secured at an oblique angle to said rotary tubular member and being slidably coupled to said pistons rods to impart a reciprocating movement to said pistons and to said plungers, a distributing segment attached to said rotary tubular member to rotate in said interspace, said segment being formed with channels communicating with the axial bore of said tubular member and with the eccentric openings of said intermediate partition for periodically connecting said cylinder-and-piston units to the intake port or to the discharge port in said second end plate.

4,401,416

SELF-CONTAINED ROTARY FUEL PUMP

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation-in-part of Ser. No. 123,102, Feb. 19, 1980, abandoned. This application Jan. 26, 1981, Ser. No. 228,346
The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—283 **14 Claims**



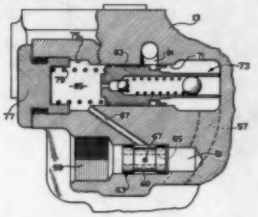
1. A power driven electric fuel pump comprising:
(a) an elongate housing having a fuel inlet at one end and a fuel outlet at the other including an inlet housing having an inlet passage and an outlet housing having an outlet passage,
(b) a rotary pump adjacent said inlet housing having an inlet plate, a rotor housing, a rotor in said housing, and an outlet plate,
(c) means for rotating said rotor in said housing, and
(d) a relief valve for said pump comprising a plurality of radially spaced inner and outer annular ridges on the face of said inlet plate forming pressure chambers within and between said ridges, and a relief valve plate biased in direction toward said ridges movable against said bias to by-pass fluid pressure from said pump.

4,401,417

HYDRAULIC PUMP AND IMPROVED FLOW CONTROL VALVE ASSEMBLY FOR USE THEREIN

Michael D. Davis, Coldwater, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 28, 1980, Ser. No. 201,650
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—300 **7 Claims**



1. A flow control valve assembly for use with a fluid delivery system of the type including a source of pressurized fluid having a fluid outlet port and a fluid operated apparatus, said flow control valve assembly comprising:
(a) housing means defining a discharge fluid path in fluid communication with the fluid outlet port, discharge port means in communication with said discharge fluid path and the fluid operated apparatus, a valve bore in fluid communication with said discharge fluid path, and another fluid path communicating between said valve bore and a region of fluid at a relatively lower fluid pressure;
(b) a metal valve spool movably disposed in said valve bore and having an integral spool land operable substantially to prevent fluid communication from said discharge fluid path to said another fluid path when the fluid delivery system is operating below a predetermined control setting, said valve spool being movable to a position wherein said spool land permits fluid communication from said discharge fluid path to said another fluid path when the fluid delivery system is operating at said predetermined control setting;
(c) said spool land comprising a generaly cylindrical wall portion, the outer surface therefore cooperating with said valve bore to define a generally cylindrical clearance, said spool land further comprising an annular well portion cooperating with said valve spool to define an annular fluid chamber in fluid communication with said discharge fluid path; and
(d) said cylindrical and annular wall portions being sufficiently thin, and said annular wall portion being at least as thin as said cylindrical wall portion, to permit said cylindrical wall portion to expand radially, substantially reducing the normal cylindrical clearance between said outer surface and said valve bore, when said annular fluid chamber is in communication with fluid at relatively higher fluid pressure.

4,401,418

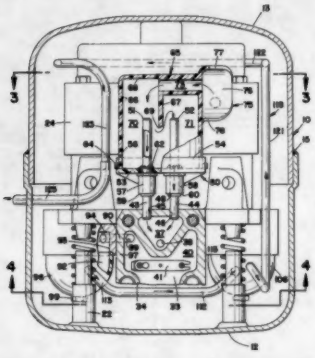
MUFFLER SYSTEM FOR REFRIGERATION COMPRESSOR

Jack F. Fritchman, Cullman, Ala., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Apr. 29, 1981, Ser. No. 258,667
Int. Cl.³ F04B *11/00, 21/00*
U.S. Cl. 417—312 **17 Claims**

1. A hermetic refrigeration compressor comprising a case having discharge and return lines secured thereto, a motor compressor unit mounted inside said case and including a cylinder housing having a single cylinder and a piston therein, an electric motor secured to the upper side of said cylinder housing to drivingly reciprocate said piston in said cylinder, a

cylinder head secured to said cylinder housing, said cylinder head including an inlet chamber and a discharge chamber, discharge muffler means connecting said discharge chamber to said discharge line, a suction muffler connected to said inlet chamber, said suction muffler being supported on at least one suction tube secured to said cylinder head and comprising an elongated closed hollow shell having sidewalls extending



longitudinally adjacent said electric motor, said sidewalls defining an inlet opening at the end away from said cylinder head and laterally adjacent said return line on said case, said shell having a deflector extending laterally from the sidewall thereof adjacent said inlet opening and across the return line opening to deflect and guide refrigerant gas from said return line angularly through said inlet opening into the interior of said suction muffler.

4,401,419

MOTOR-COMPRESSOR

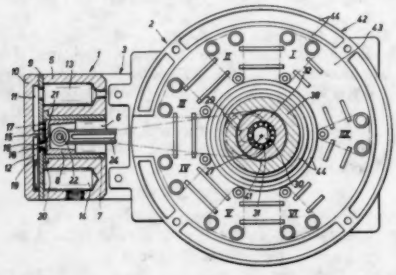
Erich Rabe, Nuremberg, Fed. Rep. of Germany, assignor to Electrolux Siegen GmbH, Siegen, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,139

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938255

Int. Cl.³ F04B *17/00, 35/04*

U.S. Cl. 417—415 **2 Claims**



1. A motor-compressor for a refrigerator, including:

(A) a direct current motor comprising:

(1) disc shaped rotor means presenting a conical surface portion and acting as a flywheel of large mass, said disc shaped rotor means being provided with

(a) permanent magnet means,

(b) spaced disc means for closing the magnetic flux, and

(c) a central part, of diamagnetic material, to which said permanent magnetic means and said magnetic flux closing discs are attached;

(2) disc shaped stator means located between said spaced disc means so as to maintain a precise planar air gap;

(3) a plurality of electrically commutated drive coils carried by said stator means and located in said air gap generally in a single plane; and

(4) a starter coil arranged in the stator means in the same plane as said drive coils and electrically phase shifted therefrom;

(B) an electronic system comprising:

(1) goniometric indicator means for detecting the position of such rotor means relative to said stator means, said goniometric indicator means being operable to generate signals determining the direction of rotation of said rotor means as a function of the polarity of the permanent magnet means;

(2) bridge circuit means for generating current flux for driving the rotor;

(3) alternating current generator means, commutated for rotation of said rotor in a predetermined direction, for modulating said bridge circuit means in accordance with signals received from said goniometric indicator means;

(4) modulating control circuit means for starting the motor which excites said starter coil when no definite polarity is present;

(5) a delta generator for modulating pulse widths; and

(6) a filter chain associated with said starter coil to modulate said delta generator as a function of the speed of said rotor means which is a function of load;

(c) a reciprocating compressor driven by said motor and comprising:

(1) a piston slidable within a cylinder bushing of a cylinder assembly, which cylinder assembly includes a lateral port for receiving said piston during assembly; and

(2) a connecting rod connected between said piston and said motor and having a cranked part which is mounted on an external face of said disc shaped rotor means eccentrically of its axis of rotation; and

(D) support plate means attached to said compressor and to one side of said disc shaped rotor means, said support plate means including:

(1) means defining a lubricant sump into which said rotor means at least partly extends; and

(2) a bearing attachment presenting a conical surface portion, which conical surface portion together with said conical surface portion presented by said rotor means, defines a frustoconical annular channel serving as a centrifugal lubricating pump.

4,401,420

MALE AND FEMALE SCREW ROTOR ASSEMBLY WITH SPECIFIC TOOTH FLANKS

Katsuhiko Kasuya, Shimoinayoshi; Mitsuru Fujiwara, Dejimamura; Masaya Imai; Tetsuzo Matsunaga, both of Sakuramura, and Yasuo Takahashi, Ayase, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,646

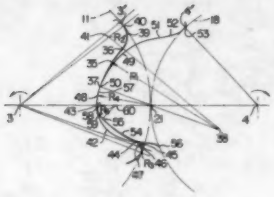
Claims priority, application Japan, Sep. 14, 1979, 54-117259

Int. Cl.³ F01C *1/16;* **F16H** *55/08;* **F04C** *18/16*

U.S. Cl. 418—201 **11 Claims**

1. An oil-cooled type screw rotor assembly having a female rotor and a male rotor adapted to rotate around parallel axes in meshing condition, wherein a leading side flank, as viewed in a normal direction of rotation, of said female rotor includes a first leading side flank formed by an arc of a radius R_1 centered at a point outside of a pitch circle of said female rotor and a second leading side flank formed by an arc of a radius R_2 centered at a point within said pitch circle, a trailing side flank of said female rotor includes a first trailing said flank generated by an arc of teeth end of said male rotor having a radius R_5

centered at a point on a line interconnecting centers of rotations of said rotors and a second trailing side flank formed by an arc of a radius R_3 smaller than the radius R_2 of said second



leading side flank of said female rotor centered at a point within said pitch circle, and wherein a tooth contour of teeth of said male rotor is substantially generated by the arcs of said leading side flanks and trailing side flanks of said female rotor.

4,401,421

APPARATUS FOR GRANULATING PLASTICS MATERIAL OR PLASTIC COMPOSITIONS

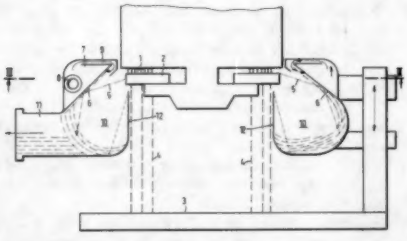
Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,136

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116153

Int. Cl.³ B29C *25/00*

U.S. Cl. 425—71 **6 Claims**



1. Apparatus for granulating fused or molten masses of extruded plastics material, comprising:

(a) feed means for said material, including a perforated plate through which material in extruded, strand form passes.

(b) rotatable cutter means positioned downstream of said perforated plate, said cutter means including a cutter holder and a plurality of cutter blades mounted on said holder, said blades being adapted to be rotated out of alignment with said perforations during start up of the apparatus and into alignment with said perforations for cutting the strands during the granulating process,

(c) collection chamber means for collecting the granulated material, said chamber means including a downwardly and outwardly inclined wall against which the granulated material impacts, and a radially inner wall which defines a central opening which throughout its length is at least equal to or greater than the dimension of the peripheral surface of said perforated plate, whereby during start up of the apparatus strands can pass downwardly through said central opening and not be directed into said collection chamber, and

(d) water feed means located adjacent said collection chamber means, said water feed means including means for centrifugally accelerating the water as a result of which the water passes over said outwardly and downwardly inclined wall surface of said collection chamber means to carry away said granulated material.

4,401,422

CHUCK ASSEMBLY IN A LOADER OF A TIRE VULCANIZER FOR CONVEYING AND INSERTING GREEN TIRES

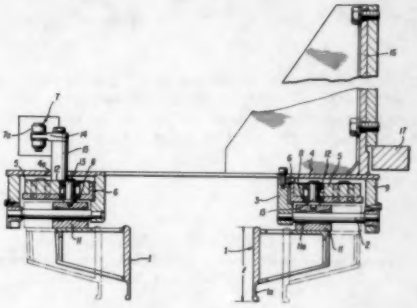
Itaru Amano, Kobe, and Yasuhiko Fujieda, Akashi, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Dec. 10, 1980, Ser. No. 214,969

Claims priority, application Japan, Dec. 21, 1979, 54-178369[U]

Int. Cl.³ B29H *5/02*; B66C *1/54*

U.S. Cl. 425—38 **6 Claims**



1. A chuck assembly for use in a loader for a tire vulcanizer having a tire centering mechanism with at least a center post and bladder, comprising:

a ring-shaped chuck main casing comprising an inner cylinder having a bore long enough to allow insertion of said press center mechanism;

an outer cylinder concentrically surrounding the periphery of said inner cylinder;

an upper cover connecting said inner and outer cylinders;

a plurality of rails radially aligned between said inner and outer cylinders in said main casing;

a plurality of chucking paddles held by sliders with shafts, each said slider slidably extending on one of said rails for movement along said one of said rails; and

a ring-shaped chuck cam rotatably disposed between said inner and outer cylinders and about a rotational axis of said inner cylinder in said chuck main casing, said chuck cam including working cam grooves extending in a direction having a radial component, wherein said slider shafts of respective ones of said paddles are slidably engaged with said working cam grooves.

4,401,423

APPARATUS FOR BLOW MOLDING HOLLOW PLASTIC BODIES

Pierre Bellehache, Sainte Adresse, and Jean M. Houdan, Montivilliers, both of France, assignors to Societe de Machines pour la Transformation des Plastiques, Nancy, France

Filed Mar. 17, 1982, Ser. No. 358,779

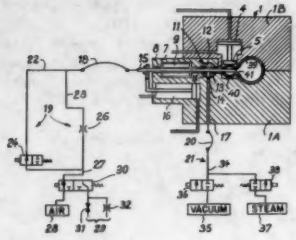
Claims priority, application France, Mar. 20, 1981, 81 05598

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—210 **3 Claims**

1. A blow molding apparatus for manufacturing hollow plastic bodies, comprising: an openable mold (1), a hollow blow needle (15), a sterilization chamber (9) defined within a half (1A) of said mold, means (16) for moving the needle between a sterilization position in which a front portion thereof is disposed within the chamber and a blowing position in which said front portion is introduced into a cavity (3) of said mold,

the needle being slidably disposed within a passage (8) which exits into a further cavity (4) of the mold, means for selectively connecting a rear portion of the needle to a sterile gas supply source (28) or to the atmosphere (29), and a portion of said



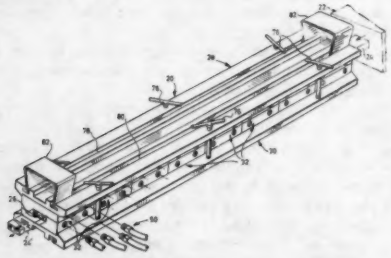
passage adjacent the further cavity comprising two aligned channels (12, 13) within a three-way distributor core (11) providing selective connection of the sterilization chamber (9) to the mold cavity or to a source of water vapor (37).

4,401,424

VACUUM SIZING DEVICE

Vittorio De Zen, 5 Riverview, Woodbridge, Ontario, Canada

Filed Feb. 12, 1982, Ser. No. 348,467
Int. Cl.[3] B29C *17/04*
U.S. Cl. 425—388 10 Claims



1. A vacuum sizing device having a passageway which extends longitudinally therethrough and which has a cross-sectional size and shape corresponding to the required profile size and shape of a plastic extrusion to be sized in the device, wherein the device comprises:

a plurality of pairs of respective upper and lower sizing elements, each pair of elements being shaped to define therebetween a longitudinal portion of said passageway and the pairs of elements being disposed end to end and maintained in co-operating relationship in which the elements together define the whole of said passageway;

upper and lower backing members disposed respectively above and below said pairs of sizing elements and extending over the entire length of said passageway, and

means releasably securing said backing members together to maintain the pairs of sizing elements in said co-operating relationship;

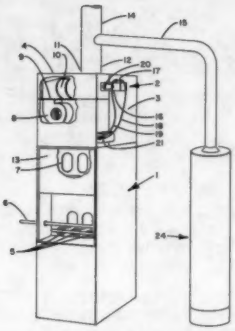
each said sizing element being an individual component and at least some of said elements being provided with one or both of a vacuum port which communicates with vacuum openings into said passageway, and a cooling fluid port communicating with a cooling fluid chamber in said element, said port or ports opening into a face of the element which is accessible from externally of the device.

4,401,425

SAFETY SWITCH FOR A COMBUSTION SYSTEM

Gerald K. Gable, Carmel, and Daniel J. Dempsey, Indianapolis, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,856
Int. Cl.[3] F23N *5/24*
U.S. Cl. 431—22 5 Claims



1. A vent system for a combustion system having a combustion chamber where products of combustion are generated and a heat exchanger through which the products of combustion are passed from the combustion chamber to the vent system, said vent system comprising:

a flue gas discharge box having an inlet opening, an outlet opening, and a relatively small third opening;

a fan unit for drawing products of combustion from the heat exchanger of the combustion system and for discharging these products of combustion into the flue gas discharge box through the inlet opening in the flue gas discharge box, said fan unit having a displacement relative to the size of the flue gas discharge box to provide a pressure in the flue gas discharge box below surrounding atmospheric pressure during normal operation of the combustion system;

a flue pipe means connected to the outlet opening of the flue gas discharge box, for receiving products of combustion from the flue gas discharge box;

a temperature sensing means located at the third opening in the flue gas discharge box for sensing the temperature of fluid flowing through the third opening and for generating a control signal when fluid temperatures above normal ambient temperature are sensed for a selected time duration indicating abnormal flow conditions in the vent system; and

control means for terminating operation of the combustion system in response to generation of the control signal by the temperature sensing means.

4,401,426

TORQUE LIMITING CLUTCH

David C. Heidenreich, Middleburg Heights, Ohio, assignor to Power Transmission Technology, Inc., Copley, Ohio

Filed Mar. 6, 1981, Ser. No. 238,878
Int. Cl.[3] F16D *7/02*
U.S. Cl. 464—41 12 Claims

1. A torque limiting clutch, comprising:

an input hub;

an output hub;

a pressure plate;

at least two friction surfaces affixed to said output hub, and disposed between said pressure plate and said input hub; and

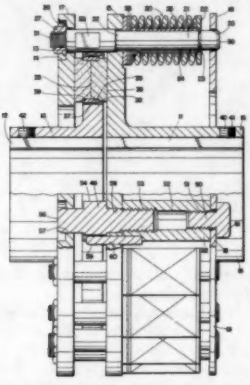
biasing means for urging said pressure plate against one of

said friction surfaces for transmitting mechanical power to said output hub, said biasing means comprising:

a plurality of bolts passing through said pressure plate and said input hub, each bolt having threads from a first end thereof to a first shoulder;

first and second stops spaced apart upon each said bolt for maintaining a precompressed spring therebetween, the length of said bolt between said first stop and said first shoulder being less than the distance between outer surfaces of said pressure plate and input hub;

a nut received by said threads to said first shoulder and in operative contacting engagement with said outer surface



of said pressure plate, said spring urging against said outer surface of said input hub;

washers encircling said bolts and disposed on each end of said spring, said bolts having two diameters forming a second shoulder defining said first stop, and a retaining ring disposed near one end of said bolt defining said second stop, whereby said springs are retained in a precompressed position; and

wherein said nut is adapted for drawing said first stop from one of said washers to provide additional predetermined spring compression at torque limiter installation when advancing on said threads.

4,401,427

THERMOPLASTIC BAGS AND METHOD OF MAKING

Gordon L. Benoit, Macedon; Franz Bustin, Rochester, and Jack J. Donaldson, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 159,971, Jun. 13, 1980, Pat. No. 4,326,664, which is a continuation-in-part of Ser. No. 20,899, Mar. 15, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 220,888

Int. Cl.³ B31B *1/20, 41/14*

U.S. Cl. 493—199 **4 Claims**

1. In a method of making a thermoplastic bag, the steps comprising:

(a) forming a thermoplastic tube having an opening at each end thereof, and front and rear walls;

(b) sealing said openings;

(c) forming a plurality of pleats in said front and rear walls, said pleats extending toward each of said sealed openings; and

(d) removing a waste portion of each of said front and rear walls, said waste portions including an intermediate portion of one of said sealed ends and portions of said pleats to form a pair of spaced handle members and a mouth portion between said handle members with said pleats being located transverse to and confined to the lower inner portion of each of said handle members and said mouth portions immediately adjacent said lower inner portions of said handle members being confined to regions most susceptible to tearing.

4,401,428

ZIGZAG FOLDING APPARATUS HAVING MEANS FOR DECREASING INERTIAL FORCES DURING RECIPROCATION

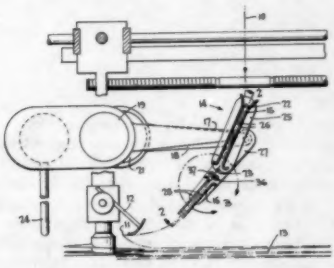
Hermann Thomas, Darmstadt, and Hans Jakob, Darmstadt-Eberstadt, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Goebel GmbH, Darmstadt, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,130

Claims priority, application European Pat. Off., Nov. 4, 1980, 80201044.7

Int. Cl.³ B65H *45/20*

U.S. Cl. 493—415 **3 Claims**



1. In a folding apparatus including an oscillating multi-section guide channel device for delivering a web of paper or other material downwardly from a web conveyor in zigzag folds, said device comprising upper and lower funnels interconnected about a pivot axis for pivotable movement relative to one another and each including a pair of spaced walls for guiding the web therebetween, means for oscillating each said funnel independently of one another, and means on said device comprising a pair of rolls for drawing the web downwardly therebetween, the improvement wherein the walls are contoured and said pair of spaced walls of each of said funnels are of light weight metal and the confronting surfaces of each said pair of spaced walls are contoured for structural stability and to facilitate migration of air with the drawn web, said pair of rolls of said drawing means being mounted on said lower funnel, said rolls respectively being mounted for rotation on axes located between said upper and lower funnels and at a short predetermined minimum distance from the pivot axis of said interconnected funnels, lower and upper ends of said walls of said upper and lower funnels respectively lying on opposite sides of said rollers, and at least one of said ends of one of said walls being spaced from said rollers in the direction of web movement so as to define at least one opening in the vicinity of said pivot axis for the entry of air between said one wall and the wall spaced therefrom, whereby the proximity of said

rollers to said pivot axis and the contoured light weight metal walls reduced inertia forces during oscillating movement of said device and the migration of air with the web facilitates drawing of the web through the device to thereby increase the operating speed of the folding apparatus.

4,401,429

SELF-EMPTYING SOLID BOWL CENTRIFUGE

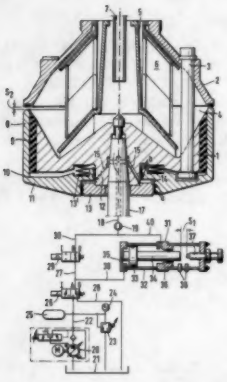
Karl Koslowski, Hamminkeln, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,551

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009669

Int. Cl.³ B04B *11/00*

U.S. Cl. 494—30 **14 Claims**



1. A solid bowl centrifuge for separating substances of varying densities such as solid liquid mixtures, the centrifuge having a rotatable separating vessel symmetrical about its axis with a circumferential annular discharge gap for the discharge of separated heavy substances, and an annular slide valve for controlling the size of the gap, said centrifuge comprising:

means defining a pressure chamber having an element connected to the slide valve for closing the gap responsive to pressure in the chamber;

a pressure line connected to an external closed hydraulic system operating independently of centrifugal force of the centrifuge controlling fluid directed into the pressure chamber to control said gap;

and spring means between the vessel and the slide valve biasing the valve in a direction for opening said gap against the action of said pressure chamber.

4,401,430

METHOD OF AND APPARATUS FOR DETOXIFYING MAMMALIAN HOSTS

William J. Dorson, Jr., and Vincent B. Pizziconi, both of Tempe, Ariz., assignors to Biomedical Labs., Tempe, Ariz.

Filed Apr. 16, 1981, Ser. No. 254,633

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—4 **7 Claims**

1. In detoxifying a mammalian host, the method which comprises extra-corporeal treatment of biological fluid derived from said host and containing protein-bound toxicant, with a physiologically acceptable chemical agent capable of liberating the toxicant from the protein without replacing the toxicant at the protein moiety and without adversely affecting the fluid at the concentration employed by increasing the ratio of said toxicant's free soluble form to the total content of said toxicant.

2. A method according to claim 1 in which the treated fluid is returned to said host.

4,401,431

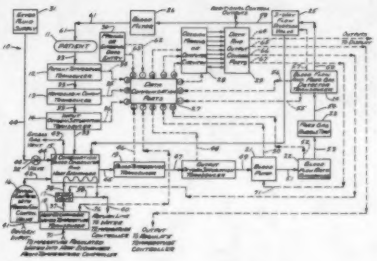
BLOOD PUMP AND OXYGENATOR MONITOR-CONTROLLER AND DISPLAY DEVICE

Leon J. Arp, 1107 Highland Cir., S.E., Blacksburg, Va. 24060

Filed Jun. 26, 1981, Ser. No. 277,887

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—4 **20 Claims**



1. A blood pump and oxygenator monitor-controller and display device comprising:

a plurality of sub-systems, said sub-systems being connected in fluid communication by a plurality of conduits, said conduits being connected to the blood supply of a patient, said blood supply being circulated from said patient through said subsystems and conduits and then back to said patient, said subsystems including transducers means for sensing parameter values of said blood supply and converting said parameter values into data input signals;

a plurality of data communication ports for receiving data input signals from said transducer means and being operably connected to decision making circuitry, said data communication ports transmitting said data input signals from said transducer means to said decision making circuitry;

a plurality of data output ports operably connected to said decision making circuitry for the purpose of receiving a plurality of signals produced by said decision making circuitry;

a plurality of data display devices operably connected to said data output ports for the purpose of receiving and displaying a plurality of signals transmitted from said data output ports;

a plurality of output control ports operably connected to said decision making circuitry for the purpose of receiving a plurality of signals produced by said decision making circuitry, said output control ports being operably connected to one or more of said sub-systems to modify the response or operation of the said sub-systems.

4,401,432

STORAGE, MIXING AND FILTERING RECEPTACLE FOR SYRINGE

Boris Schwartz, 625 Lafayette Ave., Hawthorne, N.J. 07506

Filed May 26, 1982, Ser. No. 382,290

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—89 **15 Claims**

1. An add-on device for storing, mixing and filtering a fluid and concentrated component, said add-on device including:

(a) a syringe having a rigid outer barrel;

(b) a hollow needle secured to a distal end of said outer barrel and providing a communication pathway from the exterior to the interior of said syringe barrel;

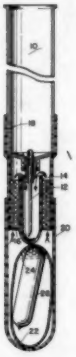
(c) a tubular sheath having two ends with a first end of said sheath mountable in a fluid-tight manner on the outer

surface of the distal end of said barrel or an interior sheath member removably attached to said end, said tubular sheath having an extending portion in and on which the secured end is formed;

(d) means for closing the second end of the sheath and inhibiting the passage of any air and the like into the sheath after mounting said sheath on the barrel and closing of the second end;

(e) a rigid inner ampule or capsule with a thin wall susceptible for breaking and in a stored condition encapsulating a concentrate, after which it is sealed to prevent loss of contents;

(f) a rigid outer ampule or capsule with a thin wall adapted for breaking and in a stored condition having fluid and



said inner sealed ampule therein and then said outer ampule is sealed to prevent loss of stored contents, and

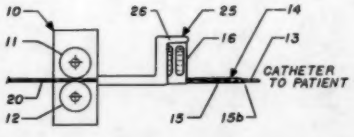
(g) filter means interposed between the distal end of the hollow needle and the sealed rigid outer ampule, said filter means mounted in the sheath so that any and all released and mixed fluids must and do pass through the filter means by negative pressure developed through aspiration of the syringe whereby that sheath portion near the closure end and adjacent the rigid outer and inner ampules is sufficiently flexible and thick so that manipulation by an operator of said flexible portion may be made to break said ampules, shake the now exposed contents and draw this mixture through the filter means and into the syringe after which the add-on device is removed from the syringe barrel and discarded.

4,401,433

APPARATUS FOR ADVANCING OVERSIZED CATHETER THROUGH CANNULA, AND THE LIKE

Ronald B. Luther, 530 King Rd., Newport Beach, Calif. 92663

Filed Jun. 13, 1980, Ser. No. 159,123
Int. Cl.³ A61M 5/00
U.S. Cl. 604—159 **7 Claims**



1. An apparatus for introducing a catheter into a vein perforation, and the like through the barrel of a cannula, needle and the like, the cannula providing holder wings for separating the barrel, comprising:

a. catheter means;

b. a cannula with holder wings;

c. compression means for folding the catheter from its normal configuration having a larger cross sectional area than the cannula bore into a cross sectional area smaller than its normal configuration, the compression means including:

i. a resilient, hollow compression head having an open and closed position, and adapted in the open position to receive an unfolded catheter lengthwise, and in the closed position to compress the catheter from the unfolded to a folded configuration along the catheter length;

ii. normally outwardly biased, opposed compression arms mounted at either side of the compression head, and adapted to be forced together thereby closing the head and folding the catheter lengthwise, each arm having a longitudinal slot, each holder wing of the cannula being inserted into and engagement with the slot;

d. advancing means to forward the folded catheter through the cannula into a vein perforation produced by the cannula while engaged by the wings and compression means, the catheter being constructed of a flexible material having a sufficient plastic memory, whereby it will unfold from its smaller cross sectional area into its larger cross sectional area, thereby tightly fitting into the vein and perforation, the cannula being adapted for:

i. removal by retraction from the vein;

ii. disengagement of the wings from the longitudinal slots of the compression arms; and,

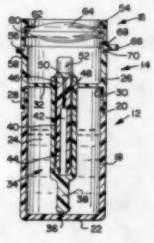
iii. removal from the catheter, by flexing the wings to break apart the cannula.

4,401,434

KIT ADAPTED TO FACILITATE STORAGE AND USE OF SPLINTER-REMOVING MATERIALS

Jeanette C. Harris, 1636 N. Wells St., Chicago, Ill. 60614

Filed Jun. 22, 1981, Ser. No. 275,639
Int. Cl.³ A61F 17/00
U.S. Cl. 604—310 **5 Claims**



1. A kit containing equipment and medication adapted to facilitate removal of slivers or like foreign substances from the human body, said kit comprising, in combination, a fluid receptacle and means forming a part thereof for receiving a cap thereover in fluid tight relation, a cap unit for said fluid receptacle, said cap unit including a fluid applicator and an instrument-receiving portion forming a part thereof, at least one splinter removal instrument detachably disposed in said instrument receiving portion of said cap, and a view enlarging assembly having a portion thereof adapted to be received and secured over said cap unit in overlying relation to said instrument-receiving portion of said cap.

4,401,435

OXIDIZING MEDIUM FOR DYES

Ralph A. Davis, and Randy C. Stauffer, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Filed Apr. 14, 1980, Ser. No. 140,358
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ D06P 1/22, 1/28
U.S. Cl. 8—627 7 Claims

1. In a method to oxidize dyes on fibers by contacting the fiber with an acidic, aqueous solution containing a bromate and an iodate, the improvement comprising including in the solution a soluble vanadium-containing material capable of forming a vanadate ion.

4,401,436

PROCESS FOR COOLING PARTICULATE COAL

Bernard F. Bonnecaze, Littleton, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 333,145
Int. Cl.³ C10L 5/30
U.S. Cl. 44—1 G 9 Claims

1. In a process for producing a dried particulate coal fuel having a reduced tendency to spontaneously ignite from a low rank coal selected from the group consisting of subbituminous, lignite and brown coals, said method consisting essentially of:

a. charging said particulate low rank coal to a coal drying zone;

b. drying said coal in said coal drying zone to produce a dried coal;

c. Recovering said dried coal from said coal drying zone;

d. Cooling said dried coal in a coal cooling zone to a temperature below about 100° F. by contacting said dried coal with a cooling gas to produce a dried cooled coal;

the improvement comprising; spraying a controlled quantity of water onto said dried coal in said coal drying zone, said water being sprayed onto said dried coal in an amount sufficient to remove a desired quantity of heat from said dried coal upon evaporation of said water and substantially completely evaporating said water from said coal in said coal cooling zone.

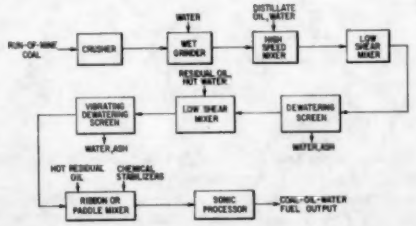
9. The improvement of claim 1 wherein said dried coal is oxidized prior to cooling said dried coal.

4,401,437

APPARATUS FOR MANUFACTURING AND STABILIZING COAL-OIL-WATER FUEL MIXTURE

Leonard E. Poetschke, Chester Basin, Canada, and Vernon Zeitz, Springfield, Vt., assignors to Scotia Recovery Systems Limited, Halifax, Canada

Continuation-in-part of Ser. No. 249,918, Apr. 1, 1981. This application Dec. 28, 1981, Ser. No. 334,539
Int. Cl.³ C10L 11/08, 1/32
U.S. Cl. 44—2 34 Claims



1. Apparatus for manufacturing a coal-oil-water mixture for use as a fuel comprising

(a) a grinder for grinding coal to a relatively fine particle size;

(b) mixing means for controllably mixing said coal particles with water and oil; and

(c) a sonic agitator to stabilize the coal-oil-water mixture; the sonic agitator comprising:

(i) a processing chamber for said coal-oil-water mixture to be treated therein;

(ii) two opposed plates in contact with said mixture in said chamber, said plates being for oscillation at a predetermined frequency and said plates being disposed substantially parallel to each other;

(iii) means functionally connected to each of said opposed plates for causing each of said opposed plates to oscillate at said predetermined frequency;

(iv) means functionally connected to each of said opposed plates for causing each of said opposed plates to oscillate in a predetermined relative phase relationship; and

(v) means functionally connected to each of said opposed plates for causing each of said opposed plates to oscillate at a predetermined amplitude.

4,401,438

MATCH PANEL STRIKER

Khayyam Ali, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, c/o Khayyam Ali, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Feb. 1, 1982, Ser. No. 344,884
Int. Cl.³ A24F 27/10
U.S. Cl. 44—45 2 Claims

1. An article of manufacture on which a match can be struck, comprising in combination a wall mounted panel and a frame around said panel, an abrasice material coated on a front side of said panel as to ignite said match when struck thereacross, and a plurality of matches forming part of said frame.

2. The combination as set forth in claim 1, wherein a head of each match is bent around an edge of said panel to a rear side thereof and wherein the opposite end of each match are joined by perforated material extending from the rear side of the panel to the front side thereby forming a portion of the frame.

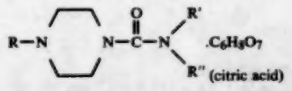
4,401,439

FUEL AND LUBRICANT COMPOSITIONS FOR OCTANE REQUIREMENT REDUCTION

L. B. Graiff, and T. E. Klovsky, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1981, Ser. No. 336,222
Int. Cl.³ C10L 1/22
U.S. Cl. 44—63 7 Claims

1. A fuel composition comprising a major portion of hydrocarbons boiling in the gasoline range and incorporating a minor amount of an additive composition which exhibits octane requirement reduction properties, said additive composition comprising a class of substituted urea citrate salts represented by the formula:



where R, R' and R'' are hydrocarbyl groups having from 1 to 3 carbon atoms.

4,401,440
METHOD AND INSTALLATION FOR PREPARING A COMBUSTIBLE GAS MIXTURE

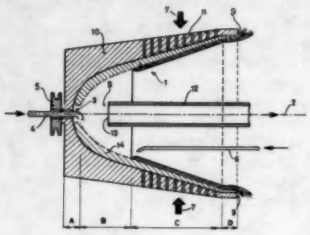
Aloysius J. W. O. Alink, Zevenaar, Netherlands, assignor to Thomassen Holland B. V., Rheden-de Steeg, Netherlands

Filed Feb. 24, 1982, Ser. No. 351,789

Claims priority, application Netherlands, Mar. 4, 1981, 8101056

Int. Cl.³ C10J *3/42, 3/48*

U.S. Cl. 48—61 **7 Claims**



1. A method of preparing a combustible gas mixture from solid or liquid fuels such as e.g. coal, heavy oil or tar sand, while using a processing chamber formed by a rotatable supporting grate having the form of a body of revolution, the fuel being fed to the inner side of said grate, while in addition a gasifying fluid is being supplied on the outer side of the grate and the combustible gas mixture is discharged via an outlet means in the vicinity of the central axis of the grate, a rotational speed being maintained during operation which is such that the fuel is pressed against the supporting grate, a granular or pulverulent refractory auxiliary material continuously being admitted to the inner side of the cup-shaped, divergent supporting grate in such a manner, that the entire inner side is covered with a layer which, due to the angle of inclination of the inner side and under the influence of the centrifugal force, gradually moves from the point of admission in the center of the cup to the circumferential edge of the cup, the feeding of the fuel proceeding upon the traveling layer causing said fuel to move along with the auxiliary material.

3. An installation for preparing a combustible gas mixture comprising a supporting grate having the form of a body of revolution which is rotatable about a central axis and provided with a fuel feed on the inner side of the grate, a supply means for gasifying fluid on the outer side of the grate and a central outlet means for the combustible gas mixture, means in addition being provided for driving the supporting grate (1), the inner side of which is cup-shaped and roughly corresponds to the form of a paraboloid, means (4) being provided in the proximity of the top of the paraboloid for supplying a granular or pulverulent refractory auxiliary material to the inner side of the grate, said material passing, during operation, along the inner side toward the free edge (9) of the cup as a result of the centrifugal force, the fuel feed means (6) being located at a point downstream of said supply means (4) and upstream of the fluid supply means (7).

4,401,441
DIGESTER

Gregory J. Chase, West Brookfield, Mass., assignor to Chase Precast Corp., North Brookfield, Mass.

Filed Dec. 3, 1981, Ser. No. 327,210

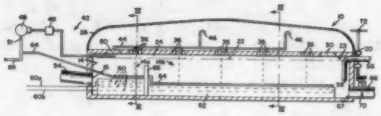
Int. Cl.³ C12M *1/00*; A01C *3/02*

U.S. Cl. 48—111 **7 Claims**

1. Digester for producing fuel gas from organic material, said digester comprising:

(a) a concrete housing which has a front end and a back end and which defines an elongated horizontal reaction chamber which extends from the front end to the back end, said housing having a continuous concrete wall with an inlet opening at the front end for receiving flowable organic material and an outlet opening at the back end through which said organic material is removed, enabling the organic material to flow through the chamber from the front end to the back end, said housing comprise a substantially closed, continuous inner layer of concrete; a substantially closed continuous intermediate layer of thermal insulating material; and a substantially closed, continuous outer layer of concrete; the housing thereby forming a substantially closed, continuous insulating envelope around the reaction chamber,

(b) heating elements which extend substantially the entire length of the reaction chamber for heating the organic material in the reaction chamber,



(c) means for collecting the fuel gas which is generated within the reaction chamber, and

(d) a baffle located within the reaction chamber between said front and back ends, said baffle extending from the bottom and across the entire width of the reaction chamber, and being spaced from the top of the reaction chamber so that said organic material is forced to flow over the baffle as it flows from said front end to said back end, the baffle dividing the reaction chamber into a forward section toward the front end and a rearward section toward the back end, the said forward section being smaller in volume than the rearward section, and wherein said heating elements are located in both, said forward section and said rearward section.

4,401,442
HIGH-SPEED DISK GRINDSTONE AND PROCESS FOR PRODUCING THE SAME

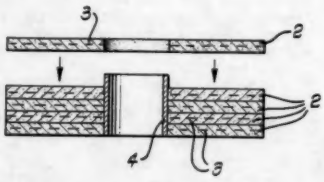
Kunimasa Oide, Kawanishi, Japan, assignor to Daichiku Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 83,397, Oct. 10, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,980

Claims priority, application Japan, Oct. 18, 1978, 53-128870; Oct. 21, 1978, 53-129838

Int. Cl.³ B24D *3/28*

U.S. Cl. 51—297 **2 Claims**



1. A process for producing a high-speed resinoid thick disk rotating grindstone comprising the steps of:

(a) forming a plurality of thin uncalcinated unit grindstones of 2 to 10 mm in thickness by pressmolding a mixture of polishing powder and thermosetting resin into which has been inserted a sheet of glass fiber mesh cloth oriented parallel to the lateral surfaces of the finished unit grindstone, the relative quantity of said polishing powder and said thermosetting resin being selected so as to result in a

unit grindstone having a resin content of from 20% to 26%;

(b) laminating said plurality of unit grindstones to a desired thickness of the finished thick grindstone, the individual unit grindstones being arrayed along an axial pipes; and

(c) calcinating the laminated array of unit grindstones formed in step (b) into a single unitary thick disk grindstone by heating said laminated unit grindstones to a temperature of between 180° to 200° C. for a preset period of time.

4,401,443

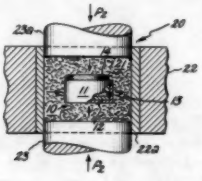
POLYCRYSTALLINE SILICON-BONDED CUBIC BORON NITRIDE BODY AND METHOD

Minyoung Lee, Schenectady, and Lawrence E. Szala, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 315,332, Oct. 26, 1981, Pat. No. 4,353,714. This application Jun. 28, 1982, Ser. No. 392,903

Int. Cl.³ C04B *35/56*

U.S. Cl. 51—307 **4 Claims**



1. The bonded polycrystalline body consisting essentially of cubic boron nitride particles and a bonding medium, said bonding medium being substantially free from carbide content and consisting essentially of silicon and silicide precipitate phase, said silicide precipitate phase characterized by the presence of silicide from the group consisting of molybdenum silicide, tungsten silicide and mixtures thereof.

4,401,444

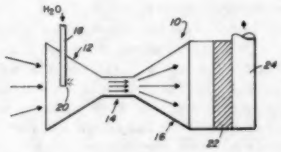
PROCESS FOR REMOVING PARTICULATES FROM GAS WITH LIQUID PARTICULATE CONDENSATION

Aaron J. Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Shrewsbury, Mass.

Filed Aug. 27, 1981, Ser. No. 297,061

Int. Cl.³ B01D *47/05, 47/10*

U.S. Cl. 55—20 **6 Claims**



1. A method for removing particulates from a gaseous stream which includes:

a. flowing the stream containing particulates of a size of one micron or less into a conduit at a static pressure of P_1, the stream containing liquid vapor at a partial pressure of P_1, a vapor pressure of P_s, and temperature T_1;

b. introducing excess liquid into the stream at temperature T_1 to form a saturated stream;

c. passing the saturated stream of step (b) into a first zone, said zone being downstream of the conduit and dimensioned to lower the static pressure to P_2 at temperature T_1; and to lower the partial pressure of the liquid vapor in the gas to P_2, less than P_s;

d. flowing the stream of step (c) into a second zone at temperature T_1, said second zone being downstream of the first zone and dimensioned to increase the static pressure in said second zone to P_3, which liquid partial pressure P_3 is greater than P_2; the partial pressure of the liquid vapor P_3 in said first zone being greater than the partial pressure of the liquid vapor P_2 in said first zone; the partial pressure of the liquid vapor P_3 in said second zone being greater than the equilibrium vapor pressure P_s in second zone, at least a portion of the liquid condensing and contacting the particulates, the particulates functioning as nucleating agents to enhance the growth of the water droplets; and removing the particulate-infected water droples from the gaseous stream.

4,401,445

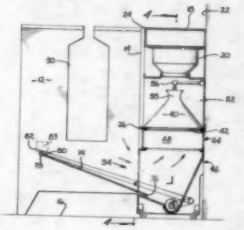
METHOD FOR CONVERTING A LIQUID PAINT SPRAY BOOTH TO A POWDER PAINT SPRAY BOOTH

Jesse Browning, 5615 Leeds St., Southgate, Calif. 90280

Filed Mar. 17, 1981, Ser. No. 244,718

Int. Cl.³ B01D *46/48*

U.S. Cl. 55—96 **7 Claims**



1. A method for converting a liquid paint spray booth to a powder paint spray booth, said liquid paint spray booth comprising an open front side, two opposing side walls having apertures therethrough for movement of items to be sprayed into said booth, and a back wall having an aperture to which a first filter means is coupled to be in communication with the interior of said booth, said method comprising the steps of:

(a) removing said first filter means from the back wall of the spray booth;

(b) replacing said first filter means with a second filter means coupled to the back wall of the spray booth, said second filter means comprising:

(i) a roll away filter cart, which rolls into place at the back of said booth, by rolling through the open front side of said booth, said cart having chamber means for collecting powder laden air from the booth through the aperture in the back wall of the booth;

(ii) filtering elements located above and in communication with said chamber means for filtering powder laden air from said chamber means;

(iii) reverse flushing means disposed above and directed toward said filtering elements for cleaning said filtering elements by directing a burst of high pressure air therethrough;

(iv) exhaust means located above the reverse flushing means for discharging cleaned air into the atmosphere; and

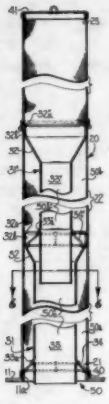
(v) a collapsible sheet disposed beneath said items to be sprayed, said sheet sloping downward and toward said chamber means and extending through the aperture in the back wall, whereby powder falling off said items is directed to said chamber means.

4,401,446

METHOD AND APPARATUS FOR INCREASING THE EFFICIENCY OF INTERNAL COLLECTION FILTER BAGS

Allen S. Johnson, Jr., Salisbury, N.C., assignor to Frances H. Johnson, Salisbury, N.C.

Filed Oct. 28, 1981, Ser. No. 315,938
Int. Cl.³ B01D 46/02
U.S. Cl. 55—97 14 Claims



1. A method of increasing the efficiency of operation of a filter bag of the internal collection type wherein air to be cleaned is directed through an open entrance end of the filter bag into the filter bag and flows outwardly through the material forming the filter bag, said method comprising separating the air to be cleaned flowing into the filter bag into a plurality of portions while essentially confining and isolating the separated portions of air from each other by directing one of the separated portions of air outside of a tubular cylinder disposed coaxially within the filter bag to cause such separated portion of air to be directed into engagement with and outwardly through a first lengthwise portion of the filter bag, while directing another of the separated portions of air axially through the tubular cylinder in bypassing relation to the first lengthwise portion of the filter bag and into engagement with and outwardly through a second lengthwise portion of the filter bag.

3. In a combination with a filter bag of the internal collection type wherein air to be cleaned is directed through an open entrance end of the filter bag into the filter bag and flows outwardly through the material forming the filter bag, an apparatus for increasing the efficiency of operation thereof and comprising

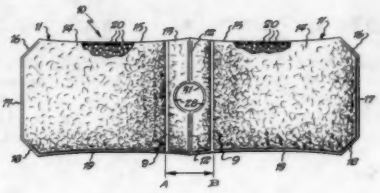
means including a tubular cylinder extending coaxially within the filter bag for separating air to be cleaned flowing into the filter bag into a plurality of portions and for essentially confining and isolating the separated portions of air from each other by directing one of the separated portions of air outside of the cylinder to cause such separated portions of air to be directed into engagement with and outwardly through a first lengthwise portion of the filter bag, while directing another of the separated portions of air axially through the cylinder in bypassing relation to the first lengthwise portion of the filter bag and into engagement with and outwardly through a second lengthwise portion of the filter bag.

4,401,447

SELF-RETAINING ADSORBENT BAG UNIT

Paul W. Huber, Lancaster, N.Y., assignor to Multiform Desiccants, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 71,768, Aug. 31, 1979, abandoned. This application Jul. 25, 1980, Ser. No. 172,266
Int. Cl.³ B01D 53/04
U.S. Cl. 55—387 36 Claims



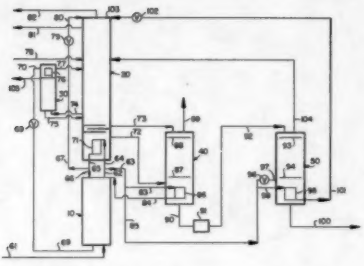
1. An adsorbent unit comprising first and second porous fabric container members having first and second porous fabric walls, respectively, first and second container edge portions on said first and second container members, respectively, first and second central container portions on said first and second container members, respectively, within the confines of said first and second container edge portions, respectively, adsorbent in said first and second container members, and elongated planar sheet-like yoke means for coupling said first and second container members relative to each other in spaced relationship for mounting said adsorbent unit relative to an external structural member, said elongated planar sheet-like yoke means having a central yoke portion and first and second spaced yoke portions on opposite sides of said central yoke portion, first and second opposite yoke edge portions on said yoke means, third and fourth opposite yoke edge portions on said yoke means, said central yoke portion and said first and second spaced yoke portions lying between said first and second opposite yoke edge portions of said yoke means and between said third and fourth opposite yoke edge portions of said yoke means, said first, second, third and fourth opposite yoke edge portions defining the yoke length and the yoke width dimensions of said yoke means, said first and second opposite yoke edge portions being connected to said first and second container members, respectively, with said defined yoke length and yoke width dimensions of said yoke means defining a connecting portion of said yoke means which extends between said first and second container members to couple portions of said first and second container edge portions proximate said yoke means in spaced relationship, said elongated planar sheet-like yoke means extending between said container members with said first and second spaced yoke portions extending in a direction away from said first and second yoke edge portions, respectively, and extending in a direction away from said first and second central container portions, respectively.

26. An adsorbent assembly for a container having a substantially central pipe extending axially thereof comprising first and second porous container members, adsorbent in said container members, yoke means for securing said first and second container members to each other, said yoke means including a central portion and outer end portions, an aperture in said central portion of said yoke means for receiving said pipe to thereby cause said first and second container members to lie on opposite sides of said pipe, and hold-down means for mounting on said pipe for pressing on said central portion of said yoke means to retain said container members in position in said container.

4,401,448
AIR SEPARATION PROCESS FOR THE PRODUCTION OF KRYPTON AND XENON

Louis M. La Clair, Grand Island, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 24, 1982, Ser. No. 381,465
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—22 **10 Claims**



1. In a process for the separation of air wherein air at greater than atmospheric pressure is subjected to rectification in a high pressure column and a low pressure column which are in heat exchange relation at a heat exchange stage, the improvement, whereby a fraction containing a relatively high concentration of krypton and xenon is produced, comprising:

(a) introducing a gaseous oxygen-rich stream, containing krypton and xenon, taken from the low pressure column above said heat exchange stage, into a rare gas stripping column provided with a first bottom reboiler;

(b) introducing a liquid oxygen-rich stream, taken from the low pressure column at a point above that from which said gaseous oxygen-rich stream is taken, into the rare gas stripping column as descending liquid reflux in an amount such that the reflux ratio of the rare gas stripping column is from 0.1 to 0.3;

(c) stripping krypton and xenon from the gaseous oxygen-rich stream into the descending liquid reflux;

(d) partially vaporizing the liquid reflux in the first reboiler by indirect heat exchange with a first condensing gaseous nitrogen-rich stream taken from the high pressure column;

(e) returning the resulting condensed nitrogen-rich stream from step (d) into either the high pressure column or the low pressure column;

(f) recovering from the rare gas stripping column a liquid first rare gas stream comprising krypton, xenon and oxygen wherein krypton and xenon are in a concentration greater than their concentration in the descending liquid reflux;

(g) introducing said liquid first rare gas stream into an oxygen exchange column provided with a second bottom reboiler;

(h) introducing a gaseous nitrogen stream, taken from the high pressure column, into the oxygen exchange column in an amount such that the reflux ratio is from 0.15 to 0.35;

(i) passing in said oxygen exchange column said liquid first rare gas stream against said gaseous nitrogen stream such that oxygen in the liquid first rare gas stream is replaced by nitrogen;

(j) withdrawing the resulting oxygen-containing gaseous nitrogen-rich stream of step (i) from the oxygen exchange column and introducing it into the low pressure column;

(k) partially vaporizing the resulting nitrogen-containing liquid first rare gas stream of step (i) in the second reboiler by indirect heat exchange with a second condensing gaseous nitrogen-rich stream taken from the high pressure column;

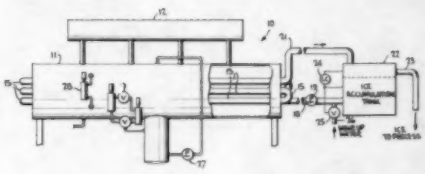
(l) returning the resulting condensed nitrogen-rich stream of step (k) into either the low pressure column or the high pressure column; and

(m) recovering a liquid second rare gas stream comprising krypton, xenon and nitrogen wherein krypton and xenon are in a concentration greater than their concentration in the liquid first rare gas stream.

4,401,449
SLUSH ICE MAKER

Walter H. Martin, and George C. Briley, both of San Antonio, Tex., assignors to Refrigeration Engineering Corporation, San Antonio, Tex.

Filed Apr. 29, 1982, Ser. No. 373,054
Int. Cl.³ F25C *1/00*
U.S. Cl. 62—59 **4 Claims**



1. An apparatus for making slush ice, comprising an elongated shell having closed end walls, a plurality of water circulation tubes lying parallel to the axis of said shell and extending between said end walls, pipe return bends located outwardly of said end walls and respectively interconnecting pairs of said tubes to define a continuous flow path between inletting and outletting ones of said tubes, a water inlet connected to said inletting tube and a water outlet connected to said outletting tube, a slush ice accumulation tank at said fluid outlet for collecting slush ice at atmospheric pressure, refrigeration means for cooling water circulating through said tubes at approximately a water freezing temperature, and a high pressure pump in said fluid inlet for pumping water through said tubes at an elevated pressure of about 2 to 4 atmospheres and at a high velocity in excess of 9 ft. per second, whereby ice crystals are formed in the water at the elevated pressure and at the high velocity and are enhanced when the pressure of the ice crystals and water is reduced to atmospheric in said tank.

4,401,450
ECONOMIC RECOVERY OF ETHYLENE AND/OR PROPYLENE FROM LOW CONCENTRATION FEEDS

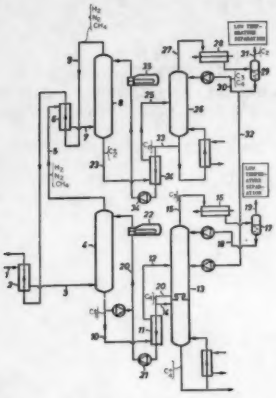
Walter Schramm, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,261
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034202; Oct. 29, 1980, 3040777
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—13 **20 Claims**

1. A process for recovering C_2–C_4 olefins from a gaseous feedstream obtained from a Fischer-Tropsch waste gas containing about 2–3 mol % ethylene or propylene, said process comprising in a first process stage, scrubbing said gaseous feedstream with a C_4–C_8 liquid hydrocarbon, to absorb said olefin therein and recovering from said liquid hydrocarbon a gaseous stream, the weight percent concentration of said olefins in said gaseous stream being at least about 25%; and in a second process stage, recovering said olefins from said gaseous stream by a low-temperature separation, and wherein said Fischer-Tropsch waste gas is subjected to a carbon dioxide separating step before entering the first stage.

11. A process for recovering C_2–C_4 olefins from a gaseous feedstream obtained from a Fischer-Tropsch waste gas containing 2–3% ethylene or propylene, said process comprising in a first process stage partially condensing said feedstream in at least one of several cyclically operated and interconnected

regenerators to condense out olefins in said regenerator and then removing said condensed out olefins therefrom as a gaseous stream having a weight percent concentration of said olefins of at least 25%; and in a second process stage recover-



ing said olefins from said gaseous stream by a low temperature separation, and wherein said Fischer-Tropsch waste gas is subjected to a carbon dioxide separating step prior to entering the first stage.

4,401,451

PROCESS AND APPAPARATUS FOR THE MANUFACTURE OF DISCONTINUOUS GLASS FIBERS

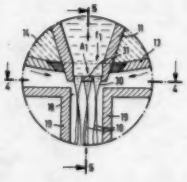
Jacques Lecron, Eaux; Maxime Manera, Bellecombette; Jean-Paul Faure, Chignin, and Jean-Pierre Renaudin, Cognin, all of France, assignors to Societe Vetrotex Saint-Gobain, Chambery, France

Continuation-in-part of Ser. No. 207,712, Nov. 17, 1980, abandoned. This application Mar. 3, 1982, Ser. No. 374,479

Claims priority, application France, Nov. 20, 1979, 79 28538; May 9, 1981, 81 09911

Int. Cl.³ C03B *37/035*

U.S. Cl. 65—1 **19 Claims**



1. Apparatus for the manufacture of fibers from a molten mineral material such as glass, comprising a supply source of glass, a bushing heated by Joule's effect, the bottom of which bushing has an elongated rectangular form, with perforations delivering a multiplicity of streams of molten material, apparatus for attenuating the glass streams comprising blower means delivering gas streams generally parallel to the vertical plane passing through the longitudinal axis of the bushing, the blower means delivering streams of gas substantially vertically downwardly at the level of said bottom or immediately below it on both sides of said bottom and means for receiving the said fibers, characterized in that the bottom of the bushing is equipped with a wall, the lower surface of which is free of projections in the portions extended between the perimeters of a multiplicity of orifices.

4,401,452

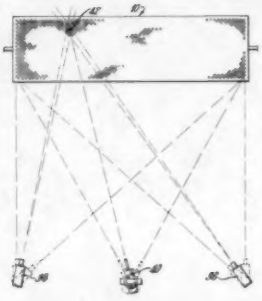
METHOD OF AND APPARATUS FOR CONTROLLING THE BREAKAGE OF GLASS FIBERS

Arnold J. Eisenberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 219,409, Dec. 22, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,179

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—2 **9 Claims**



1. A method of controlling the breakage of glass fibers comprising: feeding molten glass through an orificed wall as streams; attenuating the molten glass streams into continuous fibers; determining the specific orifice emitting the stream from which the broken glass fiber was attenuated by means of sensors; thereby preventing breakage of adjacent glass fibers in response to said sensor.

4,401,453

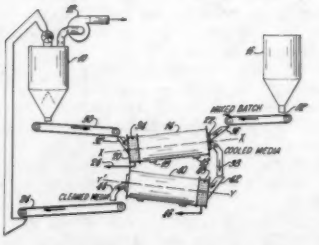
PREHEATING GLASS BATCH

Mark A. Propster, Gahanna; Stephen Seng, Bladensburg, and Charles M. Hohman, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 30, 1982, Ser. No. 373,465

Int. Cl.³ C03B *1/00*

U.S. Cl. 65—27 **11 Claims**



1. A process for producing glass by charging to a melting furnace and melting therein a particulate glass batch, including the steps of:

heating durable heat transfer media, larger in particle size than the glass batch, by direct contact with exhaust gases from the melting furnace; wherein the direct contact with furnace exhaust gases coats the media with a condensate;

using the hot media to preheat the particulate glass batch and thereby cool the media;

introducing the cool media into a cleaning container rotatable about an axis; and

rotating the cleaning container, during rotation the media tumbling and moving over each other in cleaning relation-

ship to remove the condensate from the media by abrasion of the media against each other.

6. An apparatus for preheating particulate glass batch comprising:

means for heating durable heat transfer media by direct contact with exhaust gases from a melting furnace wherein the direct contact with furnace exhaust gases coats the media with a condensate;

means for using the hot media to preheat the particulate glass batch and thereby cool the media;

a cleaning container rotatable about an axis;

means for introducing the cool media into the cleaning container;

means for rotating the cleaning container; and

means associated with the cleaning container so that the media tumble and move over each other in cleaning relationship to remove the condensate from the media by abrasion of the media against each other.

4,401,454
GROWTH REGULATION METHODS

Charles D. Fritz, North Wales, Pa.; Wilbur E. Evans, Kuala Lumpur, Malaysia, and Anson R. Cooke, Hatfield, Pa., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 869,386, Oct. 24, 1969, Pat. No. 4,374,661, which is a continuation-in-part of Ser. No. 693,698, Dec. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 617,860, Feb. 23, 1967, abandoned. This application Oct. 4, 1971, Ser. No. 186,461

Int. Cl.³ A01N *57/00*

U.S. Cl. 71—76 **31 Claims**

1. A method for regulating plant growth which comprises applying to the plant, including the fruits thereof, an effective but non-phytotoxic amount, with respect to the plant being treated, of a compound of the formula:

where

R is selected from the group consisting of 2-halo-ethyl and 2-phosphono-ethyl; and

R_1 and R_2 are selected from the group consisting of:

(a) Chlorine atom, hydroxy group and salts thereof, except that when R is chloroethyl, R_1 and R_2 are selected from the group consisting of chlorine atom and salts of a hydroxy group;

(b) The group $—OR_3$ and the group $—O—CH_2R_3$ where each R_3 is one member of the group of unsubstituted aryl, substituted aryl and heterocyclic groups;

(c) The group $—OR_3$ and the group $—O—CH_2R_3$ where each R_3 is a different member of the group of hydrogen, unsubstituted alkyl, substituted alkyl, unsubstituted aryl, substituted aryl, heterocycle, alkene and alkyne with the proviso that when one R_3 is selected from the group of unsubstituted alkyl, substituted alkyl, alkene and alkyne, the other R_3 is selected from the group of unsubstituted aryl, substituted aryl and heterocycle;

(d) Together R_1 and R_2 represent the group

where one of R_4 and R_5 is —O— and the other is selected from the group of —O—; OCH2—; —CO—O and CONH and R_6 represents a cyclic group selected from the group consisting of benzene, substituted benzene, heterocyclic ring and substituted heterocyclic ring;

(e) one of R_1 and R_2 is $—OR_7$ and the other is:

wherein each R_7 is the same or different and is selected from the group of hydrogen, unsubstituted alkyl, substituted alkyl, unsubstituted aryl, substituted aryl and a heterocycle group and wherein R is as defined hereinbefore.

4,401,455
ESTER DERIVATIVES OF N-ALKYLTHIO-N-CYCLOALKYL THIO-N-PHOSPHONOMETHYLGLYCINE AND HERBICIDAL METHODS USING SAME

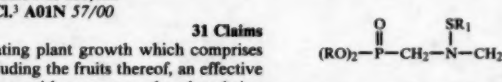
James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1981, Ser. No. 309,326

Int. Cl.³ A01N *57/22*; **C07F** *9/32*

U.S. Cl. 71—087 **27 Claims**

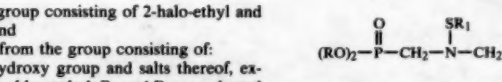
1. A method for controlling undesired plants which comprises contacting said plants or plant growth medium with a herbicidal amount of a compound of the formula



(I)

wherein R is phenyl, naphthyl or biphenylyl or phenyl, naphthyl or biphenylyl substituted with from one to three substituents independently selected from the class consisting of lower alkyl, lower alkoxy, loweralkylthio, lower alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and R_1 is alkyl or cycloalkyl and R_2 is alkyl or aralower alkyl.

6. A compound of the formula



(I)

wherein R is phenyl, naphthyl or biphenylyl or phenyl, naphthyl or biphenylyl substituted with from one to three substituents independently selected from the class consisting of lower alkyl, lower alkoxy, loweralkylthio, lower alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and R_1 is alkyl or cycloalkyl and R_2 is alkyl or aralower alkyl.

4,401,456
CONTROLLED RELEASE OF BIOACTIVE MATERIALS USING ALGINATE GEL BEADS

William J. Connick, Jr., New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 110,865, Jan. 9, 1980, abandoned. This application Apr. 28, 1981, Ser. No. 258,489

Int. Cl.³ A01N *43/00*, *25/34*

U.S. Cl. 71—88 **11 Claims**

1. A process for preparing alginate gel beads containing a herbicide material consisting essentially of:

(a) mixing a sufficient quantity of alginate for gelation with an effective quantity of herbicide material for incorporation in a final gel based, in water;

(b) placing the mixture in a vessel equipped to dispense liquids dropwise;

(c) mixing an effective quantity of water-soluble metal salt to gel mixture of (a), said salt selected from the group con-

sisting of the chlorides of calcium, barium, and copper, with a sufficient quantity of water to obtain a solution;

(d) adding, dropwise, the alginate mixture of (b) into the solution of (c); thus forming alginate gel beads which contain the herbicide material dispersed uniformly therein, allowing the beads to remain in contact with the solution of (c) for an effective period of time necessary to allow gelation; and

(e) separating the gelled beads from the solution of (c).

4,401,457

3'-(SUBSTITUTED PHENYL)-SPIRO[ISOBENZOFURAN-1(3H),5'(4'H)-ISOXAZOL]-3-ONES AND THEIR USE AS HERBICIDES

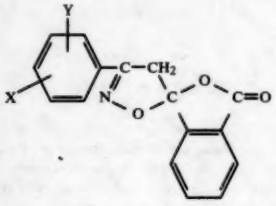
Robert K. Howe, Bridgeton, and Kou-Chang Liu, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 160,692, Jun. 18, 1980, Pat. No. 4,364,768, which is a division of Ser. No. 971,462, Dec. 20, 1978, Pat. No. 4,209,629. This application Sep. 24, 1982, Ser. No. 422,773

Int. Cl.³ A01N *43/50*

U.S. Cl. 71—88 **11 Claims**

1. A method for preventing the growth of undesirable plants which comprises applying to the plant locus a herbicidally effective amount of a compound having the formula



wherein X and Y are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, halo-lower-alkyl, phenoxy, phenyl and cyano.

4,401,458

NOVEL SUBSTITUTED BENZO-2-THIA-1,3-DIAZIN-4(3H)-ONE-2,2-DIOXIDES

Willy Meyer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

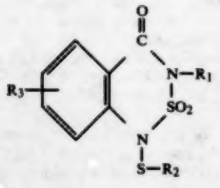
Filed Nov. 19, 1981, Ser. No. 323,019

Claims priority, application Switzerland, Nov. 24, 1980, 8659/80

Int. Cl.³ C07D *285/16*; A01N *9/14*

U.S. Cl. 71—91 **10 Claims**

1. A compound of the formula:



wherein

R_1 is alkyl of 1 to 4 carbon atoms;

R_2 is 2-cyanoprop-2-yl, 2-cyanobut-2-yl, 3-cyanopent-3-yl or 2-cyanocyclopentyl; and

R_3 is hydrogen or chloro.

4,401,459

HERBICIDAL COMPOSITION HAVING ENHANCED HERBICIDAL ACTIVITY WITH HIGH SELECTIVITY TO SOYBEAN

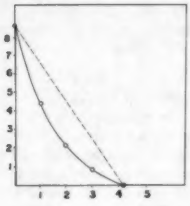
Takeo Satomi; Seizo Sumida, both of Nishinomiya, and Ryo Yoshida, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 4,832, Jan. 19, 1979, abandoned. This application Jun. 15, 1979, Ser. No. 48,730

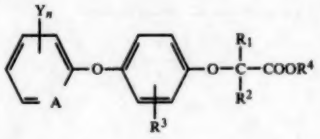
Claims priority, application Japan, Jan. 20, 1978, 53-5675; Jan. 20, 1978, 53-5676; Jan. 20, 1978, 53-5677; United Kingdom, Jan. 18, 1979, 7901849; Brazil, Jan. 19, 1979, 7900363

Int. Cl.³ A01N *43/40, 37/38, 37/34, 47/30*

U.S. Cl. 71—94 **11 Claims**



1. A herbicidal composition which consists essentially of an effective herbicidal amount of N'-[4-(4-methylphenethyloxy)-phenyl]-N-methoxy-N-methylurea as an active ingredient and as a potentiating agent at least one of the compounds of the formula:



wherein R^1 and R^2 are each hydrogen, $(C_1–C_4)$alkyl or $(C_1–C_4)$ alkoxy, R^3 is hydrogen or halogen, R^4 is hydrogen, sodium, potassium or $(C_1–C_4)$alkyl, A is =C(-Y')- or =N— in which Y' is hydrogen, halogen, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, or trifluoromethyl, Y is hydrogen, halogen, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy or trifluoromethyl and n is an integer of 1 to 4, the Y groups being the same or different from each other when n is 2 or more, the proportion of active ingredient to potentiating agent being 1 : 0.3–5 by weight in said composition.

4,401,460

HERBICIDAL PHENOXYPYRIDINES

David Cartwright, Woodley, and David Collins, Crowthorne, both of England, assignors to Imperial Chemical Industries PLC, London, England

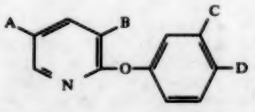
Division of Ser. No. 156,075, Jun. 2, 1980, Pat. No. 4,308,053. This application Aug. 24, 1981, Ser. No. 295,301

Claims priority, application United Kingdom, Jun. 20, 1979, 7921505

Int. Cl.³ C07D *213/64*; A01N *43/40*

U.S. Cl. 71—94 **6 Claims**

1. A phenoxypyridine of the formula (I):



(I)

wherein each of A and B is a hydrogen atom, a fluorine, chlorine, bromine or iodine atom, or a difluoromethyl, chlorodifluoromethyl or trifluoromethyl group, provided that at least one of A and B is a halomethyl group; C is an —OR^1 group wherein R^1 is an alkyl group of 1 to 12 carbon atoms substituted by a —COZ group wherein Z is a group —NR^4R^5 wherein R^4 is hydrogen, C_1–C_{12} alkyl, or C_3–C_{12} alkenyl, and R^5 is alkanesulphonyl of 1 to 6 carbon atoms; and D is nitro or cyano, or a herbicidally acceptable salt thereof.

6. A process of killing or severely damaging unwanted plants, which comprises applying to the plants, or to the locus thereof, a herbicidally effective amount of a compound of the formula (I) of claim 1 or a herbicidally effective amount of a salt thereof as defined in claim 1.

4,401,461

HERBICIDAL 4-NITRO-DIPHENYL ETHERS

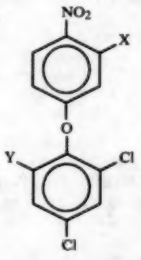
Harold F. Wilson, Jenkintown, and Marvin H. Fleischfresser, Warrington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 792,281, Apr. 29, 1977, abandoned, which is a division of Ser. No. 32,412, Apr. 27, 1970, Pat. No. 4,039,588, which is a continuation-in-part of Ser. No. 828,732, May 28, 1969, abandoned. This application Mar. 16, 1978, Ser. No. 887,266

Int. Cl.³ A01N *33/06*; C07C *87/60*

U.S. Cl. 71—121 **11 Claims**

1. A compound of the formula



wherein X is a (C_1–C_4) alkylamino group and a (C_1–C_4) dialkylamino group, and Y is a hydrogen atom or a halogen atom.

5. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of said weeds from said growth medium a compound according to claim 1 in an amount sufficient to control the growth of said weeds.

4,401,462

PROCESS FOR PRODUCING METALLIC MAGNETIC POWDER

Akio Watanabe; Tosiaki Ide, and Tatsuo Uehori, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 250,042

Claims priority, application Japan, Apr. 1, 1980, 55/43288

Int. Cl.³ C22C *1/04*

U.S. Cl. 75—0.5 BA **12 Claims**

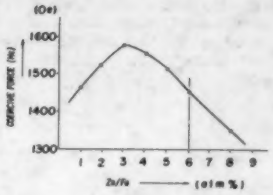
1. A method of producing a finely divided, metallic magnetic powder, comprising:

adsorbing zinc ions on iron oxyhydroxide in an alkaline bath of a base concentration greater than 1 N and simultaneously heating the mixture; and

subsequently reducing the iron oxyhydroxide having zinc ions adsorbed thereon.

2. A method of producing a finely divided, metallic magnetic powder, comprising:

adsorbing zinc ions on iron oxyhydroxide in an alkaline bath of a base concentration greater than 1 N and thereafter heating the mixture; and



reducing the iron oxyhydroxide having zinc ions adsorbed thereon.

4,401,463

PROCESS FOR THE RECOVERY OF METALS FROM THE SCRAP FROM NICKEL-CADMIUM ELECTRIC STORAGE BATTERIES

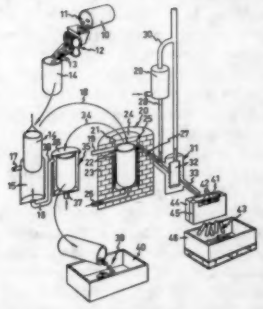
Ake L. Melin, and Vide H. Svensson, both of Oskarshamn, Sweden, assignors to SAB Nife AB, Landskrona, Sweden

Filed Sep. 21, 1982, Ser. No. 420,922

Claims priority, application Sweden, Sep. 24, 1981, 8105661

Int. Cl.³ C22B *7/00*

U.S. Cl. 75—44 S **10 Claims**



1. A process for the recovery of metals in a furnace from the scrap from nickel-cadmium electric storage batteries which in addition to nickel and cadmium also contain organic substances and iron components, characterized in the steps of

(a) opening the batteries and emptying them of their free electrolyte;

(b) drying the scrap obtained from step (a);

(c) removing the organic substances from the dried scrap by pyrolysis in said furnace by establishing a predetermined temperature and introducing a controlled atmosphere in the form of an inert gas such as nitrogen with the addition of between 3 and 12% of oxygen; and

(d) thereafter distilling off the cadmium from the organic free residue of step (c) by vaporization in said furnace in a controlled reducing gas protective atmosphere at a further higher temperature followed by condensing the vapor to obtain the cadmium,

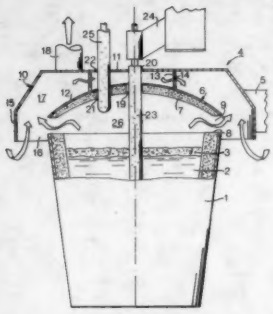
(e) and recovering a residue inside the furnace in the form of a mixture of nickel and iron scrap.

4,401,464

INJECTION METALLURGY METHOD AND EQUIPMENT FOR ITS EXECUTION

Bertil G. Tivelius, Viken, Sweden, assignor to Scandinavian Lancers Aktiebolaget, Hoganas, Sweden

Filed Apr. 12, 1982, Ser. No. 367,794
Int. Cl.[3] C21C 7/10, 5/52
U.S. Cl. 75—49 15 Claims



1. Method of producing steel comprising transferring a steel melt which has been decarburized to a desired carbon content, together with a minor more or less uncontrolled quantity of high oxide content non-deoxidised acid furnace slag into a treatment vessel, transforming the acid furnace slag at a time not later than in said treatment vessel into a synthetic slag with high sulphur trapping capacity, pre-reducing the slag by addition of reduction agent to form a slag having an FeO content no more than about 3% while purging the melt with inert gas, measuring the oxygen content of the melt after the said pre-reduction, covering the treatment vessel with a hood directly after measuring said oxygen content while continuing inert gas purging to essentially prevent access of air to the interior of the treatment vessel above the surface of the melt, completely deoxidizing the melt by adding further reduction agent thereto while continuing said inert gas purging, wherein the amount of further reduction agent added is determined by the amount of oxygen content of the melt determined in said measuring step to be necessary for complete deoxidation, taking a melt sample and analysing same for sulphur content, thereafter refining the melt with respect to sulphur by injecting at least one member selected from the group consisting of a calcium compound, a calcium alloy, a magnesium compound and a magnesium alloy, while inert gas purging the melt under the hood, in an amount determined as a function of the analysis of said melt sample, and thereafter casting the melt, whereby said melt to be cast is effectively separated from slag while reoxidation of the melt is effectively prevented to achieve a melt of low sulphur content and substantially free of slag inclusions.

4,401,465

MAGNESIUM GRANULES COATED WITH FLUORIDE CONTAINING FLUX FOR DESULFURIZING STEEL

Ramaswami Neelameggham, Salt Lake City, Utah, and John C. Priscu, Las Vegas, Nev., assignors to AMAX Inc., Greenwich, Conn.

Filed Sep. 23, 1982, Ser. No. 421,888
Int. Cl.[3] C21C 7/02
U.S. Cl. 75—58 7 Claims

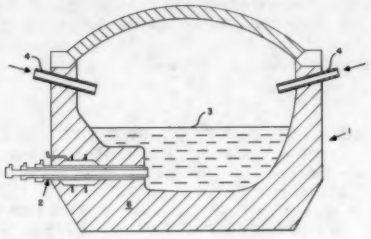
1. A desulfurizing agent comprising magnesium granules having a surface coating consisting essentially of a fluoride-containing salt in an amount ranging from about ¼ to 15% by weight of the coated granules.

4,401,466

PROCESS FOR PROTECTION OF NOZZLES AND REFRACTORY LINING OF A VESSEL FOR REFINING MOLTEN METAL

William Wells, Charlotte, N.C., and Dalton Nose, Rio de Janerio, Brazil, assignors to Korf Technologies, Inc., Charlotte, N.C.

Filed Nov. 30, 1981, Ser. No. 325,958
Int. Cl.[3] C21C 5/34, 5/42
U.S. Cl. 75—60 14 Claims



1. Process for protection of underbath blowing nozzles and refractory lining of a vessel for refining a bath of molten metal therein wherein an injection device projects through the vessel wall below the bath surface, said injection device being composed of at least three concentric pipes with annular gas passageways therebetween, said process comprising:

injecting oxygen through the central conduit of said device and injection a protective fluid through the annular passageways thereof, said protective fluid containing at least one of the group comprising an hydroxyl compound, water, and a blend of the two.

4,401,467

CONTINUOUS TITANIUM PROCESS

Robert K. Jordan, 3979 Tuxey Ave., Pittsburgh, Pa. 15227

Filed Dec. 15, 1980, Ser. No. 216,246
Int. Cl.[3] C22B 26/10, 22/04, 34/10
U.S. Cl. 75—66 17 Claims

1. A process for the production of titanium comprising:

combining a titanium fluoride and at least one of sodium and potassium to produce titanium and at least one of sodium and potassium fluorides;

combining a molten ferrous metal and at least one of the alkali fluorides to evolve at least one alkali metal from an alkali iron fluoride, and

combining alkali iron fluoride and a mineral comprising titanium dioxide and oxygen to evolve titanium tetrafluoride from alkali iron oxide.

4,401,468

PROCESS FOR REMOVING PRECIOUS METALS FROM ORE

Charles T. Henderson, 3311 W. Camelback, Phoenix, Ariz. 85017

Filed Jan. 28, 1983, Ser. No. 461,855
Int. Cl.[3] C01G 7/00, 55/00
U.S. Cl. 75—105 1 Claim

1. A process for removing precious metals from comminuted ores, comprising the steps of:

(a) contacting said comminuted ore with an effective amount of a basic aqueous solution to effect a stabilized pH of 10 to 11;

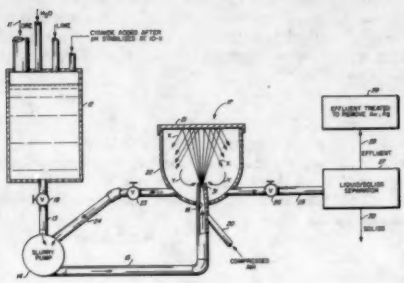
(b) allowing the pH of the ore-basic ore-aqueous solution mixture to stabilize;

(c) mixing cyanide in the stabilized ore-aqueous solution mixture to form an extraction mixture slurry;

(d) spraying said extraction mixture slurry through at least

one nozzle into an air atmosphere and deflecting said sprayed slurry back toward said nozzle;

(e) separating said sprayed slurry into a liquid and solid component; and



(f) processing said liquid component to remove precious metals therefrom.

4,401,469

MANUFACTURING CAST IRON WITH PRE-REDUCED IRON ORE PELLETS

John E. Rehder, Toronto, Canada, assignor to Microdot Inc., Darien, Conn.

Filed Mar. 9, 1981, Ser. No. 241,657
Int. Cl.³ C22C 33/08; C21C 7/02
U.S. Cl. 75—130 R 3 Claims

1. A method of making iron castings of low elastic modulus characterized by a randomly distributed flake graphite morphology comprising the steps of,

providing a melt charge comprising

a. 90–95% of pellets having an approximate composition 75% Fe, 20% FeO, 2% C, 3% gangue,

b. 3–5% ferrosilicon,

c. 3–5% carbon,

d. ±1% slag conditioners,

melting said charge, and

casting said melt.

4,401,470

INTAGLIO PRINTING INK AND METHOD OF EMPLOYING THE SAME

Robert F. Bridger, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 30, 1981, Ser. No. 249,050
Int. Cl.³ C09D 11/02
U.S. Cl. 106—20 8 Claims

1. In an intaglio printing ink composition which dries by evaporation of solvent comprising a resin, pigment and volatile solvent, the improvement which comprises adding to said composition a small amount of antioxidant composition consisting of a phenolic and amine antioxidant.

4,401,471

INORGANIC CELLULAR MATERIAL AND PROCESS FOR THE MANUFACTURE THEREOF

Peter Eckardt, Hofheim am Taunus, and Walter Dürsch, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,235
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048354; Oct. 8, 1981, 3140011
Int. Cl.³ C04B 21/02
U.S. Cl. 106—87 23 Claims

1. Inorganic substantially water-free cellular material having a density of from 100 to 500 g/l, open or closed pores having a diameter of from 0.5 to 3 mm, a thermal shrinkage of below 1%, the following composition in the solid phase:

18–50 weight % CaO
2–20 weight % Al_2O_3
5–35 weight % SiO_2
15–50 weight % P_2O_5
0–1 weight % alkali metal oxides
0–8 weight % ZnO, MgO, FeO, and/or Fe_2O_3
0–2 weight % SO_3
0–5 weight % C
0–8 weight % B_2O_3

and an equivalent ratio of (Al+Mg+Ca+Fe) to phosphate of from 0.8:1 to 3.0:1.

4,401,472

HYDRAULIC CEMENT MIXES AND PROCESSES FOR IMPROVING HYDRAULIC CEMENT MIXES

Arthur H. Gerber, Beachwood, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Feb. 26, 1982, Ser. No. 352,626
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 27 Claims

1. A hydraulic cement mix comprising a hydraulic cement, aggregate in an amount of up to 80% by weight based upon the total weight of said cement mix, sufficient water to effect hydraulic setting of the cement, and an additive comprising a poly(hydroxyalkylated)polyethyleneamine or a poly(hydroxyalkylated)polyethyleneimine or mixtures of each or both, said additive being present in an amount sufficient to increase the compressive strength of the hardened mix.

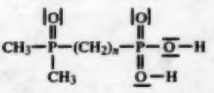
4,401,473

USE OF DIMETHYLPHOSPHINYLALKANEPHOSPHONIC ACID AS A SETTING RETARDER IN GYPSUM

Hans-Jerg Kleiner, Kronberg; Volker Knittel, Wiesbaden, and Gerhard Debus, Ruedesheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 283,511, Jul. 15, 1981. This application Feb. 23, 1982, Ser. No. 351,576
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027040
Int. Cl.³ C04B 11/00, 11/14; C01F 11/46
U.S. Cl. 106—109 1 Claim

1. Gypsum containing, as a setting retarder, a dimethylphosphinylalkanephosphonic acid of the general formula I



I

in which n is 1 or 2.

4,401,474

PYROLYTIC COATING REACTANT FOR DEFECT AND DURABILITY CONTROL

Harold E. Donley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 99,459, Dec. 3, 1979, Pat. No. 4,292,347. This application May 11, 1981, Ser. No. 262,285
Int. Cl.³ B05D 3/02; C08L 91/00; C09K 3/00
U.S. Cl. 106—243 10 Claims

1. A composition for the pyrolytic deposition of a durable metal oxide film comprising:

a. a diketonate of a metal capable of thermal decomposition to the oxide of said metal; and

b. a neodecanoate of a metal capable of thermal decomposition to the oxide of said metal.

4,401,475

METHOD OF CLEARING AWAY LIQUID

Hans Eriksson, Nygatan 11, and Sylve Rönndahl, Drevstagatan 3, both of 681 00 Kristinehamn, Sweden

Continuation of Ser. No. 284,201, Jul. 17, 1981, abandoned. This application Aug. 25, 1982, Ser. No. 411,301
Claims priority, application Sweden, Aug. 5, 1980, 8005547
Int. Cl.³ B08B 7/00
U.S. Cl. 134—6 9 Claims

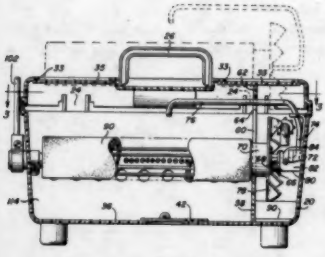
1. Method of utilizing a flowable absorbent material for the absorbing and clearing of liquid spills from a surface area, comprising filling said material into a plurality of cases of liquid-passing filter material, sealing said cases with the absorbent material therein to define individual cases with a volume of about 1 cm^3 to about 4 cm^3, spreading multiple filled cases over the surface to cover the area to be cleared, allowing the cases with enclosed absorbent material to absorb the liquid to be cleared away, and removing the cases with the absorbed liquid.

4,401,476

METHOD FOR CLEANING PAINT ROLLERS

William C. Klaiber, 601 York Rd., Fayetteville, N.C. 28303

Division of Ser. No. 83613, Oct. 11, 1979, Pat. No. 4,294,272. This application Jul. 15, 1981, Ser. No. 283,363
Int. Cl.³ B08B 3/04
U.S. Cl. 134—33 5 Claims



1. The method of cleaning a paint roller, said method including:

(A) slowly rotating a paint roller about a stationary longitudinal axis with its lower periphery disposed slightly below and parallel to the surface of a body of cleaning liquid in which the lower periphery of the roller is disposed;

(B) rapidly rotating the roller free of said cleaning liquid while directing a plurality of side-by-side closely spaced jets of rinse liquid against the roller at points spaced therealong; and

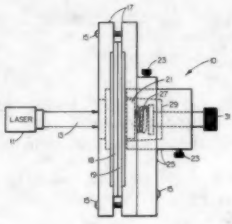
(C) thereafter rapidly rotating the roller free of said cleaning liquid and rinse liquid to spin dry the paint roller, said body of cleaning liquid being contained within a container therefor including opposite sides spaced slightly outwardly of the periphery of said roller, one of said sides having cleaning liquid level maintaining drain openings formed therein generally horizontally aligned with the lower marginal portion of said roller, and wherein rotation of said roller in (A) is in a direction of rotation advancing the upper marginal portion of said roller toward said one side.

4,401,477

LASER SHOCK PROCESSING

Allan H. Clauer, Worthington; Barry P. Fairand, Arlington; Stephen C. Ford, Worthington, and Craig T. Walters, Arlington, all of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed May 17, 1982, Ser. No. 378,975
Int. Cl.³ C21D 7/00
U.S. Cl. 148—4 1 Claim



1. A method of altering the properties of a metal substrate having opposed, front and back surfaces by a process of laser shocking wherein a transparent overlay material is placed in direct contact with the front surface, at least one high-pressure laser pulse is focused on the front surface imparting a high amplitude stress wave in the metal substrate traveling from the front surface to the back surface thereof wherein the improvement comprises

detachably affixing a momentum trap of a material having substantially the same acoustical impedance as the metal substrate in direct contact with the back surface of the metal substrate in such a manner that the high amplitude stress wave is substantially transmitted into the momentum trap and imparts force therein to detach the momentum trap from the metal substrate before being reflected back into the metal substrate.

4,401,478

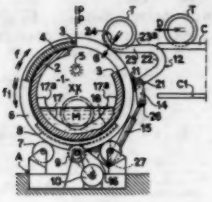
PROCESS FOR THE HANDLING AND HEAT TREATMENT OF CAST IRON OR STEEL PIPES AND TUBES

Michel Pierrel, Pont a Mousson, and Guy Mertzweiller, Blenod les Pont a Mousson, both of France, assignors to Pont-a-Mousson S.A., Nancy, France

Division of Ser. No. 172,038, Jul. 24, 1980, Pat. No. 4,353,531. This application Apr. 30, 1982, Ser. No. 373,564
Claims priority, application France, Aug. 3, 1979, 79 19940
Int. Cl.³ C21D 1/48
U.S. Cl. 148—15 7 Claims

1. A process for the heat treatment of a cast iron or steel pipe or tube, in which the pipe is immersed at least partially in a molten metal bath contained in a cylindrical furnace, and the pipe is caused to turn on itself in such a manner that all of its cross section is completely introduced into the bath during the course of rotation, characterized in that the pipe is placed within the furnace with a retaining and transferring means on rolling surfaces of the furnace such that the pipe acquires, under the effect of gravity, a position in which its external

convex surface is tangential to a concave surface of the furnace, and a reciprocating rotational movement around its axis is imparted to the furnace, whereby the pipe is caused to turn on itself while rolling in contact with the concave surface, the retaining and transferring means being articulated on an exter-



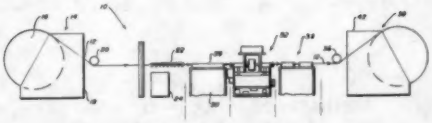
nal wall of the furnace in such a manner that the retaining and transferring means can penetrate within the furnace in order to place the pipe on the rolling surface of the furnace and can be moved out of the furnace in order to remove the pipe once treated from the bath.

4,401,479

APPARATUS AND METHOD FOR PROCESSING WIRE STAND CABLE FOR USE IN PRESTRESSED CONCRETE STRUCTURES

Nathaniel R. Quick, 2904 Sheffield Dr., Indianapolis, Ind. 46229

Filed Mar. 12, 1981, Ser. No. 242,939
Int. Cl.³ C23C *11/10*
U.S. Cl. 148—6.35 **3 Claims**



1. An improved method for producing a new surface layer on steel wire strand cable having unique chemical and mechanical bond development properties when used in structures of cured concrete wherein the improvement comprises the continuous steps of:

(a) feeding a moving steel wire strand cable through an induction heating means from an in-line pay-off reel, for preheating and relieving any stresses built-up in said cable as a result of its manufacturing process and to elevate said cable to a predetermined temperature;

(b) quenching said cable rapidly to a predetermined lower temperature in a pre-quenching tank containing jet spray means after it passes through said heating means;

(c) continuous ultrasonic surface and deep crevice cleaning of said moving cable by means of cavitation action induced in a liquid coupling medium contained in a high frequency vibrating cylindrical in-line magneto-restriction apparatus, said induced cavitation action resulting from ultrasound pressure waves generated by said magneto-restriction apparatus having a cylindrical transducer through which said cable passes, said transducer producing radial pressure waves longitudinally along said strand cable while passing through said transducer at pressures on the order of 10^6 atmospheres;

(d) passing said ultrasonically cleaned cable through an in-line post-quenching spray bath to thereby further reduce the temperature said cable to a temperature of at least 72° F. whereby the formation of a substantially pure rust coating is formed on the surface thereof as it enters on air atmosphere on exiting said post-quenching bath, said rust coating is uniquely suited for producing a tenaciously strong chemical and mechanical bond interstitially with a cured concrete mixture and its surface to thereby produce a high flexural strength concrete structure;

(e) rewinding said rust coated cable on a large diameter takeup reel to eliminate possible built-in curvature in said cable along its length; and

(f) contacting said rust coated cable with cement.

4,401,480

METHOD OF SELECTIVE GRAIN GROWTH IN NICKEL-BASE SUPERALLOYS BY CONTROLLED BORON DIFFUSION

Edwin A. Crombie, III, West Chester, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 970,047, Dec. 15, 1978, abandoned. This application Oct. 19, 1981, Ser. No. 312,574
Int. Cl.³ C22F *1/10*
U.S. Cl. 148—11.5 N **9 Claims**

1. A method of producing a composite grain structure in nickel-base superalloy articles, said method comprising:

(a) preparing a nickel-base superalloy containing, by weight percent, 0.01–0.10 carbon and 0.02–0.08 boron;

(b) forming said alloy into a configuration approximating the final configuration;

(c) heating said article to a temperature of 1,800° to 2,500° F. and holding said article at said temperature for 1 to 10 hours; and

(d) diffusing boron into a nonreducing atmosphere from only selected portions of said hot article by exposing only said selected portions to said nonreducing atmosphere to allow grain growth in said selected portions while maintaining carbon content to provide an effective limit to grain growth.

4,401,481

STEEL ROD ROLLING PROCESS, PRODUCT AND APPARATUS

Martin Gilvar, Oakham, and Robert B. Russell, Chestnut Hill, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Continuation-in-part of Ser. No. 111,122, Jan. 10, 1980, abandoned. This application Dec. 11, 1980, Ser. No. 215,331
Int. Cl.³ C21D *8/06*
U.S. Cl. 148—12 B **19 Claims**

1. A process for hot rolling and cooling medium to high carbon steel rod in uninterrupted sequence wherein the rod issuing from rolling, is laid in spread-out rings onto a conveyor and cooled through a first, austenite effective grain growth phase, and a second austenite transformation phase, comprising the steps of:

effectively growing the austenite grains along the length of the rod substantially throughout the first cooling phase at differing rates by forcing a gaseous cooling medium through and around the rings in a substantially continuously maintained distribution as the rings move along the conveyor to cool the rod non-uniformly whereby the austenite grains, in the rod in the areas which are more matted due to overlapping cool more slowly, and in the areas where they are less matted cool more rapidly, effectively grow at a rate which is inversely proportional to the respective cooling rates associated therewith along the rod;

cooling the respective portions of the rod through the second cooling phase by forcing the same gaseous cooling medium through and around the rings in substantially the same continuously maintained distribution to substantially match the cooling rates of the first cooling phase whereby the respective austenite grains in the respective places along the rod cool through transformation at a rate which is substantially inversely proportional to their respective effective grain sizes, and

maintaining the rings in substantially the same relative posi-

tions of mutual overlap and contact on the conveyor throughout the first and second cooling phases.

4,401,482

FE—CR—CO MAGNETS BY POWDER METALLURGY PROCESSING

Martin L. Green, and Richard C. Sherwood, both of New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 123,691, Feb. 22, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 328,231

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—104 **7 Claims**

1. Method for producing a magnetic body, said method comprising sintering and aging a compact, said compact having been obtained by compressing a mixture, said mixture comprising metallic particles and a binder material, said method comprising heating prior to sintering to remove said binder from said compact,

said mixture comprising at least 50 weight percent Fe, at least 10 weight percent Cr, at least 1 percent Co, and at least 0.1 weight percent of said binder, and

said binder consisting essentially of at least one binder material which is selected from the group consisting of fatty acids, amides of fatty acids, and esters of fatty acids,

whereby the presence of detrimental nonmagnetic phases in said body is minimized.

4,401,483

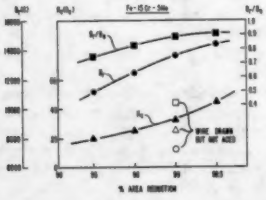
METHOD FOR MAKING A MAGNETICALLY ANISOTROPIC ELEMENT

Sungho Jin, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 194,252, Oct. 6, 1980, Pat. No. 4,337,100. This application Jan. 18, 1982, Ser. No. 339,902

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—120 **5 Claims**



1. Method for making a magnetic element consisting essentially of a body of a metallic alloy having a magnetic squareness ratio which is greater than or equal to 0.7 and having a remanent magnetic induction which is greater than or equal to 7000 gauss, said method being CHARACTERIZED BY the steps of (1) annealing a metallic body consisting essentially of an alloy comprising an amount of at least 95 weight percent Fe, Cr, and Mo, Cr being in the range of 6–26 weight percent of said amount and Mo being in the range of 1–12 weight percent of said amount, annealing being by heating at a temperature in a range of 800–1250 degrees C., (2) rapid cooling, (3) severely deforming to produce permanently anistropic grain structure, and (4) aging at a temperature in the range of 500–800 degrees C.

4,401,484

METHOD FOR HEAT TREATMENT OF METAL STRIPS

Hiromu Yoshimoto, Chita; Michitoshi Okumura, Kasugai, and Kenji Kawate, Inuyama, all of Japan, assignors to Daidotokushuko Kabushikikaisha, Aichi and Sumitomo Kei Kinzoku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

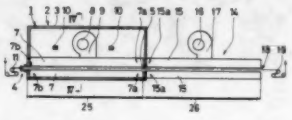
Filed Jan. 15, 1981, Ser. No. 225,224

Claims priority, application Japan, Jan. 18, 1980, 55-5112

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—131 **5 Claims**



1. In a method for the heat treatment of metal strips which includes steps of:

(i) passing a metal strip, in floating condition, successively through a heating zone and a cooling zone having a boundary zone between them,

(ii) imparting to said strip, whilst passing through said heating, cooling and boundary zones, a wave-like form which extends longitudinally of the strip over the entire length of said zones,

the improvement which comprises imparting to said strip, as it passes through said border zone, at least one wave-like form having a radius of curvature which is smaller than the respective radius of curvature of each other wave-like form imparted to said strip whilst within said heating zone and said cooling zone.

4,401,485

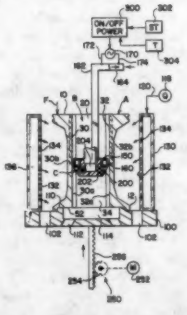
METHOD FOR INDUCTIVELY HEATING THIN-WALLED ELONGATED WORKPIECES

Donald E. Novorsky, Cleveland, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Jul. 22, 1981, Ser. No. 285,788

Int. Cl.³ C21D *1/10, 1/18, 1/42*

U.S. Cl. 148—150 **7 Claims**



1. A method of quench hardening to a selected depth the inner surface of an axially extending bore in an elongated, thin-walled workpiece having an outer, axially extending surface, which bore has a selected, uniform cross-sectional shape in a direction transverse to the elongated axis of said workpiece and bore, said method comprising the steps of:

(a) providing an inductor with an outer shape generally matching, but smaller than, said cross-sectional shape;

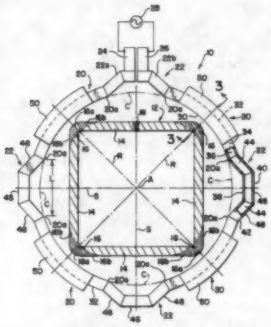
(b) supporting said workpiece with said axis extending vertically;
(c) energizing said inductor with a known frequency and a selected power level;
(d) moving said energized inductor downwardly through said bore to inductively heat said inner surface progressively while applying no fluid quench to said inner surface;
(e) then immediately moving said inductor upwardly through said bore to progressively heat said inner surface; and,
(f) progressively liquid quenching said inner surface immediately below and after said progressive heating of said inner surface upwardly.

4,401,486

METHOD FOR ANNEALING WORK HARDENED PORTIONS OF STRUCTURAL BEAMS

James J. Pusateri, Cleveland; Charles R. Bartlett, Newbury, and Paul D. Brazie, West Richfield, all of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed May 26, 1981, Ser. No. 266,882
Int. Cl.³ C21D *1/42*
U.S. Cl. 148—154 **15 Claims**



1. A method of inductively heat treating an elongate structural beam of metal plate material cold formed to provide angularly related adjacent wall portions and a work hardened corner therebetween, said method comprising inductively heating said work hardened corner progressively along the length of said beam to a given temperature for annealing said work hardened corner, and controlling said inductive heating for the temperature of heating in the direction from said corner into each of said adjacent wall portions to be progressively reduced below said given temperature, whereby said corners and wall portions have substantially the same hardness following said heat treatment.

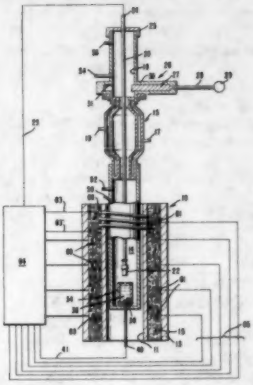
4,401,487

LIQUID PHASE EPITAXY OF MERCURY CADMIUM TELLURIDE LAYER

Arthur H. Lockwood, Goleta, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 14, 1980, Ser. No. 206,760
Int. Cl.³ H01L *21/368*
U.S. Cl. 148—171 **7 Claims**

1. A process for forming a layer of mercury cadmium telluride of a predetermined composition on the surface of a selected substrate at atmospheric pressure which comprises the steps of:
(a) providing a crystal growth melt comprising mercury, cadmium, and tellurium in a vertically-oriented crystal growth chamber, said melt comprising 33.33 mole percent or more of mercury and said melt being maintained at a predetermined temperature above the liquidus temperature thereof;
(b) providing a condensing means vertically adjacent said crystal growth chamber to condense vapors of said mercury which vaporize from said melt and to return said condensed mercury to said melt, to thereby maintain said melt at a constant composition; and



(c) contacting said substrate with said crystal growth melt for a predetermined period of time while cooling said melt below said liquidus temperature to a temperature below 390° C. at a predetermined rate sufficient to cause the crystal growth of said layer of said mercury cadmium telluride on said substrate to a predetermined thickness whereby said layer of said mercury cadmium telluride is of uniform composition and of high purity.

4,401,488

GOLD-COLORED COIN MATERIAL

Bruno Prinz, Oberursel; Manfred B. Rockel, Friedrichsdorf; Günther Rudolph, Neuberg; Ulrich Heubner, Werdohl, and Hugo Zoebe, Altena, all of Fed. Rep. of Germany, assignors to Vereinigte Deutsch Metallwerke AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,691
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116135
Int. Cl.³ C22C *9/01, 9/06*
U.S. Cl. 148—435 **5 Claims**

1. A coin made of an alloy consisting essentially of 4 to 6 percent nickel, 4 to 6 percent aluminum, 0.5 to 1.8 percent iron, the balance being copper and inevitable impurities due to manufacture.

4,401,489

ALUMINUM ALLOY FOILS FOR CATHODES OF ELECTROLYTIC CAPACITORS

Kozo Arai; Takao Suzuki, and Syozo Umetsu, all of Sakai, Japan, assignors to Showa Aluminium Kabushiki Kaisha, Sakai, Japan

Continuation of Ser. No. 133,616, Mar. 24, 1980, abandoned. This application Apr. 29, 1982, Ser. No. 372,928
Claims priority, application Japan, Mar. 27, 1979, 54-36608; Mar. 27, 1979, 54-36609
Int. Cl.³ C22C *21/12*
U.S. Cl. 148—438 **3 Claims**

1. An aluminum alloy foil for use as a cathode foil in electrolytic capacitors prepared from an aluminum alloy consisting essentially of 0.3 to 0.5 percent of copper and 0.002 to 0.05 percent of titanium and containing iron and silicon as impuri-

ties in a combined amount of up to 0.3 percent, balance aluminum, in which the aluminum used as a material is at least 99.7 percent in purity.

4,401,490

MELT EXPLOSIVE COMPOSITION

Roger D. Alexander, 15 Ripper St., Montmorency, Victoria, 3052, and Andrew J. Bates, 30 Bank St., Ascot Vale, Victoria, 3032, both of Australia

Filed Dec. 6, 1982, Ser. No. 447,135

Claims priority, application Australia, Dec. 18, 1981, PF2017

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **31 Claims**

1. A melt explosive composition comprising at least one oxygen-releasing salt, at least one melt soluble fuel material and at least one naphthalenesulfonate derivative selected from the condensates of formaldehyde and naphthalenesulfonic acids, condensates of formaldehyde and C_1 to C_{10}-(alkyl)naphthalenesulfonic acids, and the alkali metal and alkaline earth metal salts thereof.

4,401,491

SOLID SILICONE RUBBER COMPOSITIONS AS INSULATORS FROM FIRE FOR ELECTRICAL COMPONENTS

Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 886,187, Mar. 13, 1978, abandoned. This application Apr. 17, 1981, Ser. No. 255,026

Int. Cl.³ H01B *13/00*; B05D *5/12*

U.S. Cl. 156—48 **8 Claims**

1. A process for insulating electrical components located in a conduit from fire with a silicone composition wherein the silicone composition conducts away the heat generated by the electric current in the electrical component at a sufficient rate, comprising the steps of: (1) mixing a curable silicone composition having (A) 100 parts of a vinyl-containing diorganopolysiloxane polymer having a viscosity varying from 100 to 100,000 centipoise at 25° C., a vinyl content varying from 0.0004 to 1% by weight wherein the organo groups are monovalent hydrocarbon radicals; (B) from 50 to 300 parts by weight of an extending filler; (C) from 0 to 100 parts by weight of a reinforcing silica filler; (D) from 1 to 200 parts per million of a platinum catalyst; and (E) from 0.5 to 30 parts by weight of a hydrogen containing polysiloxane having from 0.4 to 1.6% by weight of hydrogen and a viscosity varying from 1 to 500 centipoise at 25° C., thereby forming a curable mixture; (2) placing said curable mixture in said conduit so as to fill the space surrounding said electrical components; and (3) allowing the curable composition to cure at room temperature.

4,401,492

BREAST PROSTHESIS AND METHOD OF MAKING THE SAME

Arthur M. Pfrommer, 1711 Maryland Ave., Croydon, Pa. 19020

Continuation of Ser. No. 139,024, Apr. 10, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,577

Int. Cl.³ A61F *1/24*

U.S. Cl. 156—61 **12 Claims**

1. A method for making a breast prosthesis comprising:

(a) forming a negative body cast of the body area comprising at least the missing breast;

(b) forming a positive cast from the negative cast and modeling a breast on the positive cast in the area of the missing breast;

(c) forming a negative mold over the modeled breast and adjacent portion of the positive body cast;

(d) removing the negative mold and modeled breast from the positive body cast;

(e) forming a back wall for the negative mold which conforms to the posterior contours of the modeled breast derived from the positive body cast;

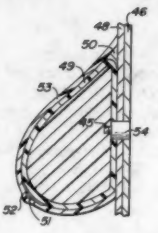
(f) removing the back wall and the modeled breast from the negative mold and replacing the back wall to form a first cavity defined by the negative mold and back wall;

(g) filling the first cavity with a curable resin and curing the resin to form a heat-resistant mandrel conforming to the interior contours of said first cavity;

(h) removing the mandrel from the first cavity;

(i) coating the mandrel with a film-forming heat-curable silicone resin and curing the film-forming resin to form a shaped first skin on the mandrel;

(j) shaping a rear wall to the portion of the mandrel defining



the posterior contours of the breast and bonding the shaped rear wall to the first skin;

(k) applying to the first skin a transparent film-forming resin and curing the applied resin to form a transparent protective second skin over the first skin;

(m) removing the mandrel from the shaped material through an aperture formed in the rear wall to form a second cavity defined by the first and second skins and rear wall;

(n) sealing the aperture in the rear wall; and

(o) filling this second cavity with a flexible material to complete the breast prosthesis.

4,401,493

REINFORCED STRUCTURES

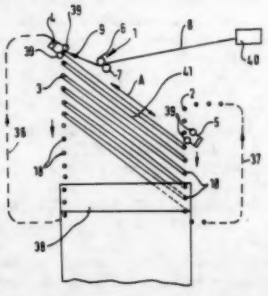
George K. Bailey, Southport; Eric Holroyd, Knutsford; Anthony R. Wright, Nuneaton, and David J. B. Perkins, Liverpool, all of England, assignors to W & A Bates Limited, London, England

Filed Oct. 9, 1981, Ser. No. 310,395

Claims priority, application United Kingdom, Oct. 16, 1980, 8033330

Int. Cl.³ B29H *17/04, 9/04*; D04H *3/05*

U.S. Cl. 156—117 **25 Claims**



1. Apparatus for making a tire breaker fabric comprising an elongate sheet of tire cord fabric embedded in elastomer in which the cords extending across the sheet are formed by one single continuous tire cord which extends back and forth

across the sheet so that the edges of the sheet are formed by a series of folded cord edges, the aparatus comprising

(a) a pair of parallel spaced apart edge holding and retaining units;

(b) each edge holding and retaining unit comprising a plurality of longitudinally spaced retractable holding pins attached to endless belt means;

(c) a tire cord laying head for laying one single continuous tire cord to and fro between said edge holding and retaining units;

(d) stepwise drive means for effecting relative movement between said endless belt means and said laying head in the direction of the length of said endless belt means so that said laying head lays said tire cord around a respective holding pin to form a continuous elongate cord assembly the edges of which are formed by a series of folded cord edges;

(e) means for applying elastomer to said cord assembly to produce tire breaker fabric; and

(f) means for moving said holding pin to withdraw said holding pins from said tire breaker fabric.

22. A method of manufacture for tire breaker fabric comprising a single tire cord having a zig-zag lay in the fabric, wherein the method comprises;

feeding tire cord to a cord feed guide, propelling the feed guide in a first direction across the space between a pair of spaced apart edge holding units each including a plurality of longitudinally spaced retractable edge loop holding pins;

moving the feed guide and the holding pins relative to one another in a direction perpendicular to the feed guide first direction of movement so that the cord is laid around a pin at one side of the space;

propelling the feed guide back across the space in the reverse direction to the first direction;

moving the feed guide and the holding pins relative to one another in a direction perpendicular to the feed guide reverse direction of movement so that the cord is laid around a pin at the other side of the space;

repeating the above steps to produce a sheet of zig-zag assembled cord;

applying elastomeric material to a side of the assembly and withdrawing the pins from the edge loops.

4,401,494

REFLECTIVE GARMENT AND METHOD OF MANUFACTURING SAME

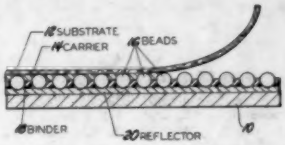
Vincent S. Pernicano, 2833 Railroad St., Boyne Falls, Mich. 49713, and Michael R. Wright, 24297 Ridgeview Dr., Farmington Hills, Mich. 48018

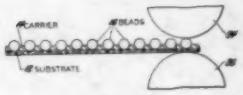
Continuation of Ser. No. 198,926, Oct. 20, 1980, abandoned, which is a division of Ser. No. 60,466, Jul. 25, 1979, Pat. No. 4,248,500. This application Feb. 19, 1982, Ser. No. 350,332

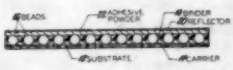
Int. Cl.³ B32B *31/00*; C09J *7/00*

U.S. Cl. 156—155 **5 Claims**

1. A method of making a reflective heat transfer combination comprising the steps of; applying a tacky carrier layer, which is responsive to heat for melting, over an absorbent substrate in a predetermined pattern so that the carrier layer may be melted in response to heat and absorbed into said substrate, embedding a layer of reflective particles into said tacky carrier layer, applying a liquid coating around said particles and over said carrier layer, applying powdered adhesive, which is responsive to heat for melting and bonding, over the coating, drying the coating to bind the particles in position and applying the heat transfer conbination to an article by placing the coating with the powdered adhesive therein against the article and applying heat and pressure to the substrate to activate the powdered adhesive whereby the adhesive responds to heat and bonds to the article and the carrier layer is melted and absorbed into the







substrated for exposing the particles upon removal of the substrate and the absorbed carrier layer.

4,401,495

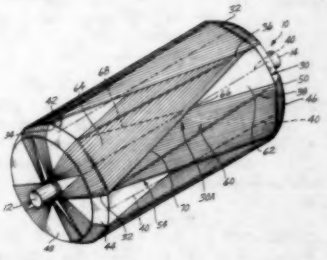
METHOD OF WINDING COMPOSITE PANELS

Maurice E. McKinney, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1981, Ser. No. 306,340

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—173 **20 Claims**



1. A method of making multiple composite panels having varied thicknesses, comprising:

rotating a mandrel having a multiple number of substantially equivalent peripheral areas;

the areas being juxtaposed and reversed to have wide and narrow axially spaced ends alternately arranged peripherally around the mandrel;

winding an impregnated filament over different surfaces of the mandrel from one polar end to the other polar end and returned the length of the mandrel to form predetermined structural shapes of multiple filaments by repeated windings on the respective areas; and

winding the filaments at selected angles with respect to the

mandrel axis and with respect to the wide and narrow ends so that the structural shapes on the respective areas vary in thickness from one end to the other such that the thickness at the wide ends are generally thicker than the thickness at the narrow ends.

4,401,496

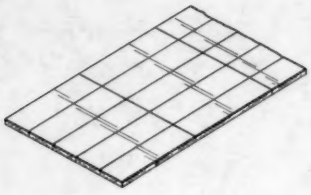
VENEER SALVAGE TECHNIQUE

Ernest T. Koontz, Jr., Thomasville, N.C., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation of Ser. No. 320,298, Nov. 12, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,187

Int. Cl.³ B32B *31/08, 31/10*

U.S. Cl. 156—182 **2 Claims**



1. A process for salvaging scrap veneer to form reusable face veneer comprising the steps of:

(a) cutting the scrap veneer into a plurality of identical size strips, such strips can range in size from 1" to 1½" wide and 6" to 24" long,

(b) feeding said identical width and length size strips of veneer to a butt jointer to fasten together said strips of veneer at their shortest dimension to form a continuous ribbon of veneer, and

(c) forming a plurality of continuous ribbons of veneer and subsequently running said plurality of ribbons side-by-side and joining together said continuous ribbons of veneer by an edge banding jointer to form a continuous sheet of glued up face veneer wherein the continuous sheet of glued up face veneer is formed with continuous strips of identical size pieces that may be matched up with or staggered relative to other continuous strips of identical size pieces to form a uniform geometric pattern in the finally formed continuous sheet.

4,401,497

METHOD AND APPARATUS FOR BUTT WELDING OF PLASTIC PIPES OF LARGE DIAMETER

Robert Warthmann, Steinmueri 2, Volketswil, Switzerland

Filed Nov. 19, 1981, Ser. No. 323,035

Claims priority, application Switzerland, Nov. 27, 1980, 8802/80

Int. Cl.³ B29C *27/02*

U.S. Cl. 156—267 **8 Claims**

1. Method for welding plastic pipes of large diameter, characterized in that welding apparatus is placed inside the pipe

said welding apparatus aligns the pipe ends (11, 12) by means of a clamping effect of the pipe ends onto a common axle (1),

and said welding apparatus pulls the pipe ends (11, 12) together to a distance suitable for turning of the pipe ends,

the pipe ends (11, 12) are prepared for the welding by means of turning,

the pipe ends (11, 12) are heated by means of a reflector operating from inside the pipe,

the pipe ends, which are still warm, are pulled together by the welding apparatus for the purpose of welding together, and

after cooling down of the welding section, the welding apparatus releases the clamping effect and thereupon either is removed from the pipe or the pipe itself is pulled away.

4. An apparatus for welding plastic pipe of large diameter, comprising,

a clamping device for holding the pipe ends,

a turning device for the pipe ends,

a heating device for the pipe ends, and

a pressing device for pressing the pipe ends together,

characterized in that, by means of the said appparatus, all the operations can be performed from inside the pipe.

4,401,498

PROCESS FOR PRODUCING RECIPROCAL ADHESION AT THE INTERFACE BETWEEN TWO CONTACTING LAYERS WITH ALUMINUM HYDROXIDE BEING INCLUDED IN ONE OF SAID LAYERS

Ulrich W. K. Jahn, and Bernd H. Holzapfel, both of Marburg, Fed. Rep. of Germany, assignors to A.Kettenbach Fabrik Chemischer Erzeugnisse, Dental-Spezialitäten GmbH & Co. KG., Eschenburg-Eibelshausen, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,012

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102196

Int. Cl.³ B29H *5/01;* **A61C** *9/00*

U.S. Cl. 156—307.1 **8 Claims**

1. In a process for producing reciprocal adhesion at the interface between two contacting layers, whereof one layer is formed from condensation crosslinking polysiloxane and the other of said layers is formed from an addition cross-linking polysiloxane, the improvement which comprises adding aluminum hydroxide to at least one of the polysiloxane layers prior to crosslinking.

4,401,499

CROSSLINKED RESIN OF EPOXY COMPOUND AND ISOCYANATE AND PROCESS FOR PRODUCING SAME

Shoroku Kaneko, Yokosuka; Sigenori Yamaoka, Yokohama; Masuo Mizuno, Yokohama, and Yukihiro Okabe, Yokohama, all of Japan, assignors to Sumitomo Bakelite Company Limited, Japan

Filed Dec. 1, 1981, Ser. No. 326,306

Claims priority, application Japan, Jun. 9, 1980, 55-76665; Jun. 9, 1980, 55-76666; Feb. 6, 1981, 56-15623

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—307.3 **17 Claims**

1. A crosslinked resin obtained by subjecting to reaction one equivalent of an isocyanate compound having isocyanate groups in the molecule with 0.5 to 10 epoxy equivalents of an epoxy compound having alcoholic hydroxyl groups and epoxy groups in the molecule, to first react the isocyanate groups of the isocyanate compound with the alcoholic hydroxyl groups of the epoxy compound, thereby forming an epoxy prepolymer having urethane linkages stable at room temperature; subsequently heating the resulting prepolymer at a temperature at least 40° C. higher than the reaction temperature for the formation of the prepolymer to dissociate the urethane linkages and regenerate the isocyanate groups; and then reacting the said isocyanate groups with the epoxy groups of the epoxy compound.

17. A process for producing a laminate which comprises subjecting to reaction one equivalent of an isocyanate compound having isocyanate groups in the molecule and an epoxy compound having epoxy groups and alcoholic hydroxyl groups in the molecule in an amount corresponding to 0.5 to 10 epoxy equivalents and 0.2 to 3 alcoholic hydroxy equivalents to first react the alcoholic hydroxyl groups of the epoxy compound with the isocyanate groups of the isocyanate compound, thereby forming an epoxy prepolymer having urethane linkages stable at room temperature; thereafter heating the prepolymer at a temperature at least 40° C. higher than the reaction temperature for the formation of the prepolymer to dissociate the urethane linkages and regenerate the isocyanate

groups; reacting the regenerated isocyanate groups with the epoxy groups if necessary in the presence of 100 parts by weight or less, per 10 parts by weight of the prepolymer, of a bisimide and/or 0.1 to 2 equivalents, in terms of amine equivalent, acid anhydride equivalent or hydroxy equivalent, per equivalent of the epoxy group of the prepolymer, of at least one compound selected from the group consisting of amine compounds, carboxylic acid anhydrides, phenol novolac compounds and polyvinyl-phenol compounds; impregnating a fibrous substrate with the resulting resin composition; superposing at least one sheet of the resin-impregnated substrate on a metallic foil; and pressing the resulting assembly with heating.

4,401,500

PRIMER COMPOSITION USED FOR ADHESION

Mitsuo Hamada, Kisaratsu, and Sadami Yasuda, Ichihara, both of Japan, assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 25, 1982, Ser. No. 352,507
Claims priority, application Japan, Mar. 27, 1981, 56-44781
Int. Cl.³ C09J 5/02
U.S. Cl. 156—307.5 **17 Claims**

1. A method for adhering silicon rubber to a substrate comprising coating the substrate with a primer composition, air drying the coating for at least 30 minutes to form a primer coated substrate, applying a heat curable silicone rubber composition over the primer coated substrate to make an assembly, heating the assembly to a temperature which cures the silicone rubber composition, and a silicone rubber bonded to the substrate is obtained, said primer composition consisting essentially of

(A) 100 parts by weight of an alkoxy containing silicon compound selected from the group consisting of an alkoxysilane represented by the formula

$$R_aR_b'Si(OR^2)_c$$

wherein R is a monovalent radical selected from the group consisting of alkyl radicals, halogenated alkyl radicals, and aryl radicals; R′ is a monovalent radical selected from the group consisting of alkenyl radicals and XR^3- radicals in which X is a monovalent radical selected from the group consisting of acryloxy radical, methacryloxy radical, N-aminoalkylamino radical, amino radical, N-alkylamino radical, epoxy radical, and mercapto radical, and R^3 is a divalent radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals, hydroxyhydrocarbon radicals and ether radicals; R^2 is an alkyl radical or an alkoxyalkyl radical; a has a value of 0 to 2 inclusive; b has a value of 0 to 2 inclusive; c has a value of 2 to 4 inclusive; the sum of a+b+c is 4; and partial hydrolysis condensates of at least one alkoxysilane defined above where said condensate contains at least two alkoxy radicals per molecule,

(B) from 0.5 to 50 parts by weight of a hydroperoxide, and

(C) an organic solvent.

4,401,501

APPARATUS FOR MAKING ASSEMBLIES OF POCKETED SPRINGS

Walter Stumpf, Dunwoody, Ga., assignor to Simmons USA Corporation, Atlanta, Ga.

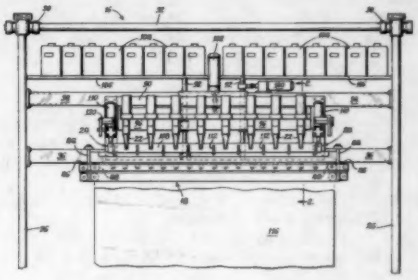
Continuation-in-part of Ser. No. 242,678, Mar. 11, 1981, abandoned. This application Jan. 29, 1982, Ser. No. 343,892
Int. Cl.³ B23K 19/04; B29C 27/08; B30B 15/16
U.S. Cl. 156—367 **9 Claims**

1. Apparatus for making an assembly of strips of pocketed upholstery coil springs as a spring core for a mattress or cushion or the like by joining successive strips of such springs to each other seriatim, comprising,

a support defining an assembly station,

a series of probe-like anvils arrayed in a line on said support and spaced from one another so as to engage a strip of said pocketed springs in said assembly station between two adjacent springs at intervals along said strip,

a series of fastening heads each movably mounted on said support for movement into and out of engagement with one of said anvils and normally spaced therefrom a distance sufficient for the placement of two strips of pocketed springs between said anvils and associated fastening



heads, with the intercoil webs of the pocket material of the two successive strips aligned in the paths of movement of said fastening heads to said anvils,

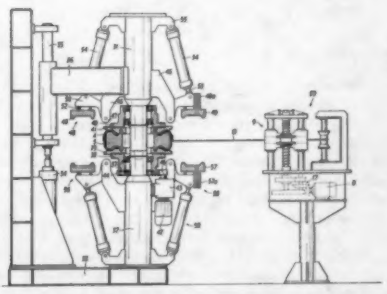
and means for moving the fastening heads into and out of fastening cooperation with said anvils to fasten said new strip to the preceding strip between adjacent coils of each of said two strips.

4,401,502

METHOD AND APPARATUS FOR MOLDING A TIRE WITH AN ANNULAR REINFORCEMENT BELOW THE TREAD SURFACE

Oskar Schmidt, Chicago 5, 2421 Kittsee/Bgld., Austria

Division of Ser. No. 951,659, Oct. 16, 1978, Pat. No. 4,259,129. This application Nov. 20, 1980, Ser. No. 208,837
Claims priority, application Austria, Mar. 5, 1978, 3234/78
Int. Cl.³ B29H 17/02, 11/00
U.S. Cl. 156—397 **8 Claims**



1. Apparatus for producing a tire with a tread surface and an annular reinforcement below the tread surface, comprising support means; a core having an axis and being mounted on said support means for rotation about its axis, said core being adapted to carry a tire body for rotation therewith; means for rotating the core about its axis; means for guiding an elongated reinforcement onto the outer surface of the tire body on said core during rotation of the latter to thus wind the reinforcement onto a portion of the peripheral surface of the tire body; two groups of outer mold segment means mounted on said support means about said core for respectively molding a tire body and a tread surface portion of the tire about the tire body

and the reinforcement wound thereon, said two groups of mold segment means being tiltable about tilting axes extending laterally of and transversely to said axis of said core and respectively spaced from opposite ends of the latter; and means between said support means and said mold segment means for tilting said mold segment means about the respective tilting axes; said rotating means, said guiding means, said mold segment means and said tilting means cooperating with each other such that the tire body is first molded about said core, then the reinforcement is wound on said body and subsequently the tread surface portion is molded about said body.

4,401,503

APPARATUS FOR THIS APPLICATION OF AN ADHESIVE WEB LONGITUDINALLY AND WITH U-SHAPED SECTION ABOUT THE EDGE OF A SHEET METAL PANEL OR THE LIKE SHAPED PART OF SHEET METAL

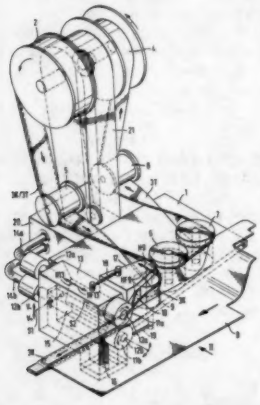
Helfried Hertel, Lörrach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,523

Claims priority, application Switzerland, Aug. 17, 1981, 5301/81

Int. Cl.³ B65H *31/00*

U.S. Cl. 156—461 **13 Claims**



1. An apparatus for applying an adhesive web longitudinally and with U-shaped cross section about the edge of a panel or the like shaped part of sheet metal, being equipped with web-guiding means comprising a funnel-like pre-folding channel having an entry end, an exit end and a central longitudinal axis therethrough; a pair of feed and press-on rollers each of which rollers comprises a feed roller shaft being spring-biassed to press one roller against the other, said feed and press-on rollers being adapted for receiving between them a pre-folded adhesive web emerging from said pre-folding channel and for pressing said pre-folded adhesive web against an edge and against the opposite sides adjacent said edge, of said shaped part of sheet metal, while said part is being introduced into contact with said folded adhesive web; bearing means on which said pair of feed and press-on rollers is pivotally mounted to be swivable as a unit about a common swivel shaft, said swivel shaft having a longitudinal axis which extends parallel to said shafts of said feed and press-on rollers and is located, ahead of said roller pair, taken in the direction of travel of said sheet metal part and adhesive web between said feed and press-on rollers of said pair, at least approximately in the plane of symmetry of said pre-folding channel, said feed and press-on rollers being adapted for being driven by motor means and exerting on the sheet metal part, being pulled through said unit by said feed and press-on rollers, an at least approximately constant force of conveyance even when differences occur between the speeds of the two rollers of said pair.

4,401,504

JOINING APPARATUS

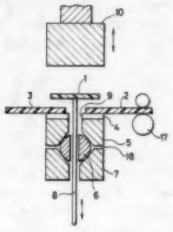
Kazuhiko Kobayashi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa and Mitomo Co., Ltd., Tokyo, both of, Japan

Filed Aug. 25, 1981, Ser. No. 296,023

Claims priority, application Japan, Aug. 29, 1980, 55/122473[U]

Int. Cl.³ B31F *5/06*; G03D *15/04*

U.S. Cl. 156—505 **8 Claims**



1. In a joining apparatus having a joining table with an adhesion preventing member on its upper surface and a joining head movable downwardly toward said joining table to press materials to be joined and a joining material against said joining table, the improvement comprising; means for supporting said joining table in a pivotable manner, wherein the upper surface of the joining table may follow the movement of the lower surface of the joining head to provide intimate contact therewith; and

a movable guide member for said joining material, said guide member projecting through said joining table and said means for supporting to support said joining material at a point above adjacent edges of the materials to be joined.

4,401,505

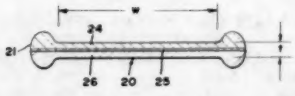
METHOD OF INCREASING MINORITY CARRIER LIFETIME IN SILICON WEB OR THE LIKE

James K. Liu, Glendale, Calif.; Guenter H. Schwuttke, Poughkeepsie, N.Y., and Krishna M. Koliwad, La Canada, Calif., assignors to The United States of America as represented by the Administrator National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1982, Ser. No. 364,092

Int. Cl.³ C30B *15/34, 29/06, 33/00*

U.S. Cl. 156—608 **10 Claims**



1. A process of increasing the lifetime of minority carriers the steps comprising:

simultaneously growing a multiple layer semiconductor material to possess at least one layer containing impurities and a layer containing inherent defects resulting from the growing step;

placing said material in a furnace containing at least one preselected gas; and

heating said material in said furnace for a selected duration

and temperature, whereby impurities in said one layer are gathered by defects in said layer containing defects.

4,401,506

PROCESS FOR PRODUCING SEMICONDUCTOR DEVICE

Hideo Otsuka, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 13, 1981, Ser. No. 321,130
Claims priority, application Japan, Nov. 19, 1980, 55-162922
Int. Cl.³ C30B 25/20
U.S. Cl. 156—612 11 Claims

1. A process for producing a semiconductor device which comprises the steps of:

implanting oxygen ions into a surface of a silicon monocrystalline substrate to an extent that said ion implanted surface still remains as a monocrystalline silicon;

precipitating said oxygen by a heat treatment thereby producing micro defects in said ion implanted surface; and

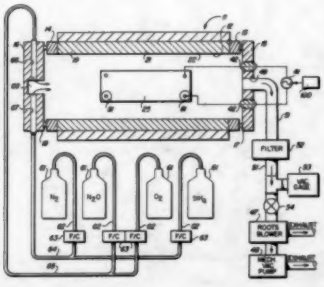
forming a silicon monocrystalline epitaxial growth layer on said ion implanted surface.

4,401,507

METHOD AND APPARATUS FOR ACHIEVING SPATIALLY UNIFORM EXTERNALLY EXCITED NON-THERMAL CHEMICAL REACTIONS

George M. Engle, Scottsdale, Ariz., assignor to Advanced Semiconductor Materials/AM., Phoenix, Ariz.

Filed Jul. 14, 1982, Ser. No. 398,066
Int. Cl.³ B05D 3/06; B05B 5/02; B44C 1/22; C03C 15/00
U.S. Cl. 156—643 9 Claims



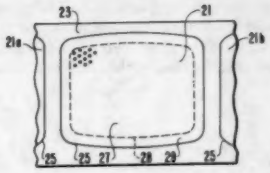
5. A method for carrying out an external excitation of a non-thermal chemical reaction within a container having an active region with at least one reactant located within said container comprising the step of externally exciting a non-thermal chemical reaction within said active region of said container, and substantially interrupting the external excitation of said chemical reaction for a time substantially equivalent to the transit time of said reactant through said active region of said container.

4,401,508

METHOD FOR REMOVING INSOLUBILIZED PVA FROM THE SURFACE OF A BODY

Peter M. Ritt, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 27, 1982, Ser. No. 436,946
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—659.1 10 Claims



6. In a method for etching a metal body including the steps of:

(a) producing on a surface of said body an etch-resistant stencil consisting essentially of insolubilized dichromate-sensitized polyvinyl alcohol,

(b) etching said body by contacting said stencil-bearing surface with an aqueous etching solution of ferric chloride and hydrochloric acid, said hydrochloric acid being present in concentration that is ineffective to remove said stencil from said body,

(c) and then removing said stencil from said body,

the improvment which consists in removing said stencil at step (c) by contacting said stencil and surface with an aqueous stripping solution containing at least one mineral acid selected from the group consisting of hydrochloric acid and phosphoric acid, said at least one acid being present in a concentration that is effective to remove said stencil from said body.

4,401,509

COMPOSITION AND PROCESS FOR PRINTED CIRCUIT ETCHING USING A SULFURIC ACID SOLUTION CONTAINING HYDROGEN PEROXIDE

Richard Schellinger, Jr., Trenton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 7, 1982, Ser. No. 415,002
Int. Cl.³ C23F 1/00
U.S. Cl. 156—666 7 Claims

5. In the process of etching printed circuits with 2% to 20% sulfuric acid etchant using as the oxidant 2% to 10% hydrogen peroxide and 0.05% to 0.1% thiosulfate ion, and 0.005% to 0.5% of an unsaturated hydroxy compound, the improvement comprising the presence in the etchant of 0.01% to 0.4% of an aminomethylenephosphonic acid and maintaining the temperature of the etchant at 35° C. to 45° C.

4,401,510

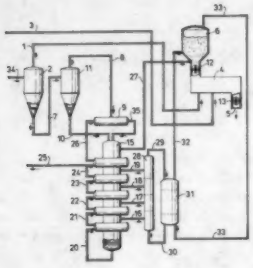
PROCESS FOR HEATING UP WOOD CHIPS PRIOR TO STEAMING AND PULPING

Torbjörn Olson, Moliden; Lars G. Olausson, Angered, and Carl-Johan Candolin, Örnsköldsvik, all of Sweden, assignors to MoDo-Chemetics AB, Ornskoldsvik, Sweden

Filed Aug. 28, 1981, Ser. No. 297,400
Claims priority, application Sweden, Aug. 29, 1980, 8006046
Int. Cl.³ D21C 1/02, 11/10
U.S. Cl. 162—19 9 Claims

1. A process for heating up wood chips in one or more stages at progressively higher temperatures prior to steaming and pulping, which comprises withdrawing vacuum steam from an evaporator for spent pulping liquor at different levels and passing it to corresponding levels in a direct condenser; passing

steam condensate at a temperature of about 50° C. through the condenser and heating it to a temperature of about 80° C., passing the resultant hot condensate in countercurrent contact flow with cool air at about 40° C. and heating the cool air to from about 70° C., while washing it, thereby forming moisture-saturated hot air; passing the hot air through a mass of wood chips, thereby preheating the chips to a temperature of about 60° C. while cooling the hot, moisture-saturated air to about 40° C.; withdrawing the cool air and recycling it to the air heating in countercurrent contact flow with said steam condensate; passing secondary steam having a temperature of about 105° C. from the upper part of said evaporator through the chips and thereby heating the chips to a temperature of up



to about 100° C., and finally heating the chips with flash steam and fresh steam having a temperature of about 125° C., thereby imparting to the chips in the heating stage a temperature within the range from at least about 115° to at least about 125° C.; digesting the heated wood chips; passing the hot liquor from the digestion to a first flash tank; and then to a second flash tank; passing steam from the second flash tank to said condenser, and heating pre-evaporated liquor in the condenser; passing the hot pre-evaporated liquor from the condenser to an evaporator; passing the hot liquor separated from steam in the second flash tank to the evaporator; feeding evaporated liquor obtained in the bottom of the evaporator upwardly, stepwise, through the evaporator; and then completing evaporation of pre-evaporated liquor.

4,401,511

CONNECTING MEANS FOR INTERCONNECTING HOUSING MEMBERS OF CONJOINED CONDUCTOR RAIL SECTIONS

Hugues E. Waldmeier, 30, Rue d'Ottmarsheim, 68170 Rixheim, France

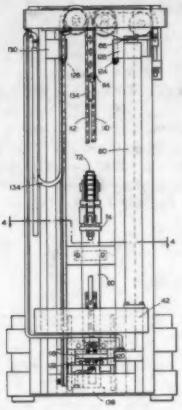
Filed May 15, 1981, Ser. No. 263,933

Claims priority, application Switzerland, May 20, 1980, 3905/80

Int. Cl.³ B60M *1/34*

U.S. Cl. 191—23 A **10 Claims**

1. Connecting means for releasable interconnection of two correspondingly shaped, downwardly open housing members respectively of two conjoined sections of an electric current conductor rail, said connecting means comprising two shell elements which are interconnectible to enclose mutually adjacent end portions of said two housing members over an area spaced away from downward openings of the housing members and fastening means for detachably fastening said shell elements together around said housing member end portions, each of said shell elements having a cross-sectional shape at least partially adapted to an external profile of a respective half of the housing cross-section and each of said shell elements being provided with at least two locating projections each extending in a respective cross-sectional plane of the associated



shell element to be engageable in a corresponding recess in a respective one of said housing members.

4,401,512

BATCH DISTILLATION

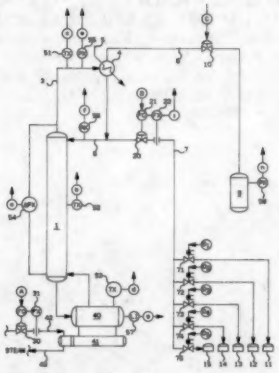
Merle R. Likins, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 221,122, Dec. 29, 1980, Pat. No. 4,328,073.

This application Mar. 5, 1982, Ser. No. 355,278

Int. Cl.³ B01D *3/42*

U.S. Cl. 196—132 **4 Claims**



1. Apparatus for separating product mixtures by distillation comprising

(a) distillation column means comprising

(aa) a kettle equipped with heating means for boiling and at least partially evaporating the product mixture in the kettle,

(bb) in communication with said kettle, a distillation zone for contacting vapors and liquids,

(cc) in communication with said distillation zone, reflux means equipped with cooling means for condensing at least a substantial portion of the overhead vapors of the distillation zone and means for conducting condensed vapors down the distillation zone,

(b) a plurality of receptacles,

(c) conduit means for allowing the conveyance of at least a portion of the distilled material from the distillation column means to each one of said receptacles,

(d) switch means for allowing automatically switching the flow of distilled material into one of said receptacles to a flow of distilled material into another of said receptacles,

(e) sensing means for automatically determining at least one distillation process parameter, and generating a start-up signal and a shut-down signal, said sensing means being operatively connected to said distillation column means, or said conduit means,

(f) automatic control means operatively connected to said sensing means for receiving said signals, said control means being also operatively connected to said switch means so as to further provide

(aa) means for enabling said conduit means to remain closed so that no distillation product may flow to a receptacle during a start-up period, when the said start-up signal has not yet reached a start-up setpoint,

(bb) means responsive to a distillation process parameter for selectively opening said conduit means so that distilled product may flow to the selected receptacle during a production operation, after said start-up signal has reached said start-up set point,

(cc) means to shut down said distillation column means responsive to said shut-down signal.

4,401,513

APPARATUS FOR PYROLYZING SHREDDED TIRES

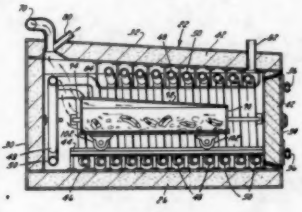
John C. Brewer, 2529 Village Cir., Salt Lake City, Utah 84108

Continuation of Ser. No. 191,171, Sep. 26, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 335,109

The portion of the term of this patent subsequent to Dec. 28, 1998, has been disclaimed.

Int. Cl.³ C10B *1/06, 27/00, 45/00*

U.S. Cl. 202—97 **8 Claims**



1. An apparatus for reducing shredded pieces of tires to their basic components, said apparatus comprising in combination an oven, a plurality of hot air conduits within said oven forming a primary heating zone within said oven, means for forcing hot air through said conduits, means at the top of said oven forming a gas collection zone, a gas discharge outlet at the top of said collection zone, a pyrolytic container within said primary heating zone for supporting the shredded pieces of tires, said container having an inclined top wall for directing vapors produced in said container directly into said gas collection zone, and condensing means operatively connected to said gas discharge outlet at the top of said gas collection zone in said oven for condensing the vapors produced on heating said shredded pieces of tires.

4,401,514

METHOD FOR THE RECOVERY OF FURFURAL, ACETIC ACID AND FORMIC ACID

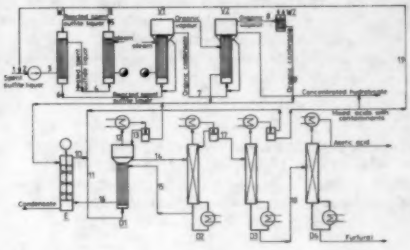
Walter Kanzler, and Johannes Schedler, both of Graz, Austria, assignors to Vereinigte Edelstahlwerke AG (VEW), Vienna, Austria

Filed Mar. 18, 1981, Ser. No. 245,076

Claims priority, application Austria, Apr. 10, 1980, 1931/80

Int. Cl.³ C07C *51/44, 51/48;* C07D *307/50*

U.S. Cl. 203—15 **14 Claims**



1. In a method of producing, recovering and separating furfural, acetic acid, formic acid and other organic compounds from acid treatment of plant material including the steps of acid hydrolysis of pentosans present in the plant material to form pentoses containing xylose, thereafter forming furfural from the pentose present in the plant hydrolysate and distillation of the furfural, the improvement comprising the steps of:

(a) introducing to and heating an acidified aqueous solution of a plant material hydrolysate in a counterflow heat exchanger;

(b) conveying the heated acidified hydrolysate solution from said counterflow heat exchanger to a reactor and converting xylose to furfural at a temperature range between about 220° C. and 300° C. at a residence time of less than 10 minutes to avoid decomposition of said furfural;

(c) returning the reacted hydrolysate solution to the counterflow heat exchanger to supply heat to freshly introduced acidified hydrolysate solution; and

(d) distilling the reacted hydrolysate solution to recover furfural, formic and acetic acids.

4,401,515

PROCESS FOR PRODUCING 1,3-BUTADIENE OR 2-METHYL-1,3-BUTADIENE HAVING HIGH PURITY

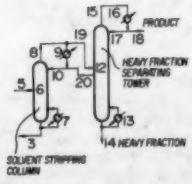
Masatoshi Arakawa, and Kazuyoshi Nakazawa, both of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,676

Claims priority, application Japan, Mar. 15, 1980, 55-32161

Int. Cl.³ B01D *3/40;* C07C *7/08*

U.S. Cl. 203—25 **19 Claims**



1. A process for producing high purity butadiene or isoprene comprising treating a C_4 or C_5 hydrocarbon mixture contain-

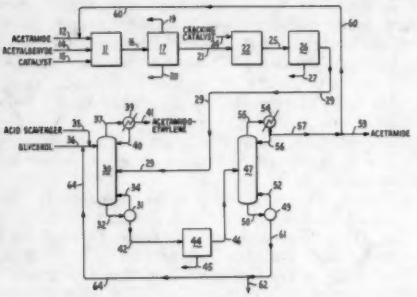
ing butadiene or isoprene by an extractive distillation method, comprising at least one extractive distillation step and at least one solvent-stripping step, in the presence of a selective solvent to obtain crude butadiene or crude isoprene containing a small quantity of heavy fraction; and separating said heavy fraction from said crude butadiene or crude isoprene in a heavy fraction separating tower, wherein said crude butadiene or crude isoprene is taken out of the top of a column as a top vapor in the extractive distillation step or the solvent-stripping step, at least a part thereof is fed to the middle stage of said heavy fraction separating tower, the remainder is condensed and refluxed to said column, and a liquid is withdrawn from said middle stage or its neighboring stage of said heavy fraction separating tower and then fed to said column together with said remainder, the total flow rate of said liquid and said remainder corresponding to the reflux rate necessary to operate said column.

4,401,516

PROCESS FOR SEPARATING ACETAMIDOETHYLENE FROM CRUDE PREPARATION PRODUCTS

David P. Matzinger, Menlo Park, Calif., assignor to Dynapol Shareholders Liquidating Trust, Palo Alto, Calif.

Filed Nov. 24, 1981, Ser. No. 324,411
Int. Cl.³ B01D *3/34*
U.S. Cl. 203—33 **11 Claims**



1. In a process for separating acetamidoethylene overhead in a distillation zone from an admixture of acetamidoethylene and acetamide the improvement comprising adding to said distillation zone from 10% to 300% (molar) based on the moles of acetamidoethylene present of a hydrogen bonding liquid having an atmospheric boiling point above 200° C.; such amount being sufficient to provide a valve of n, defined as the retention time of acetimide divided by the retention time of acetamidoethylene, of up to 4.0.

4,401,517

VAPOR-LIQUID EXTRACTIVE DISTILLATION WITH DIALKYL SULFONE/WATER COMBINATION

Fu-Ming Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

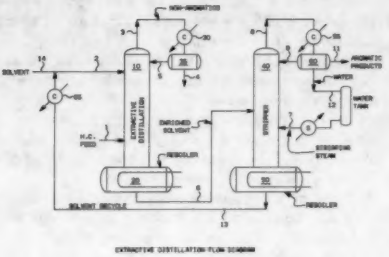
Filed Nov. 20, 1981, Ser. No. 323,772
Int. Cl.³ B01D *3/40*; C07C *7/08*
U.S. Cl. 203—53 **10 Claims**

1. A vapor-liquid extractive distillation process comprising:

introducing a feed comprising at least first and second components of similar boiling points but different solubility characteristics into a substantially vertical extractive distillation zone at a point spaced apart from a lower end of said extractive distillation zone wherein said first component is a non-aromatic hydrocarbon and wherein said second component is an aromatic hydrocarbon;

introducing into said extractive distillation zone at a point near a top thereof, a solvent comprising a dialkyl sulfone containing 5 to 8 carbon atoms per molecule and at least 1 weight percent water based on the weight of said dialkyl sulfone and said water;

withdrawing a vaporous raffinate stream rich in said first component from a top portion of said extractive distillation zone; and



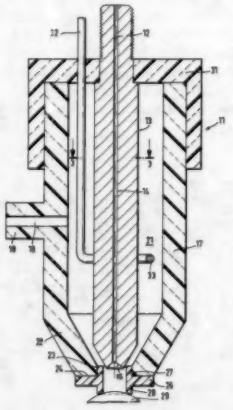
withdrawing an extract stream rich in said second component from a bottom portion of said extractive distillation zone.

4,401,518

METHOD OF MEASURING THICKNESS OF A TIN LAYER AND THICKNESS MEASURING DEVICE THEREFOR

Helmut Fischer, Bergwaldstrasse 28, 7261 Gechingen, and Willi Steegmuller, Kornstrasse 18, 7407 Rottenberg/Ergenzingen, both of Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,689
Int. Cl.³ G01N *27/26, 27/28*
U.S. Cl. 204—1 T **10 Claims**



1. In a device for measuring the thickness of a metal deposition layer on a metal sheet having an electrolyte chamber which, on the side facing the metal sheet, has an opening for letting through electrolyte to the metal sheet,

a cathode in the electrolyte chamber, and

a supply line for the electrolyte, connected liquid-tight to the electrolyte chamber, the improvement comprising:

(a) a sealing device at the chamber opening arranged to provide a negative pressure-proof seal between the opening and the layer on the metal sheet,

(b) a negative pressure flow-off line, connected to the electrolyte chamber, located at a distance from the mouth of the supply line in the electrolyte chamber,

(c) a negative pressure generator connected to the flow-off line,

a supply vessel for electrolyte, having a connection with the atmosphere, and

(e) the supply line being negative pressure-proof and running continuously into the fluid volume of electrolyte in the supply vessel.

10. Method for measuring the thickness of a metal deposition layer on a metal sheet comprising

arranging against the layer to be measured an electrolyte chamber, having an internal cathode with an opening for letting electrolyte through to the metal sheet,

providing a negative pressure-proof seal between the opening and the layer,

supplying electrolyte to the electrolyte chamber from a supply vessel having a connection to the atmosphere, and

applying a negative pressure to the electrolyte chamber through a flow-off line connected to the electrolyte chamber.

4,401,519
METHOD FOR PRODUCING RETICULATE ELECTRODE FOR ELECTROLYTIC CELLS

Igor V. Kadija, and David D. Justice, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 25, 1981, Ser. No. 238,267

Int. Cl.³ C25D *1/08, 5/48;* **C25B** *11/03;* **H01M** *4/88*

U.S. Cl. 204—11 **9 Claims**

1. A method of producing a reticulate electrode for use in the electrolysis of aqueous solutions of ionizable compounds which comprises:

(a) affixing filaments to a support fabric to form a network of filaments, said filaments being comprised of a metal or metal sensitized plastic,

(b) depositing by electroplating an electroconductive metal onto said filaments to form metal coated filaments, said deposition providing interfilament bonding at contact sites between adjacent filaments,

(c) removing said support fabric from said metal coated filament network to produce a reticulate electrode having a porosity of at least 80 percent, and

(d) depositing on only one surface of said reticulate electrode a coating of a hydrophobic coating agent.

4,401,520
PROCESS FOR THE PREPARATION OF SCREEN PRINTING STENCILS BY AN ELECTROPLATING METHOD

Hartmut Steppan, Wiesbaden; Barbara Wildenhain, Walluf, and Hans Ruckert, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

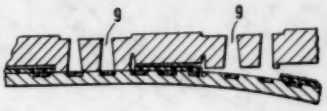
Filed Mar. 18, 1981, Ser. No. 244,965

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011192

Int. Cl.³ C25D *1/08*

U.S. Cl. 204—11 **7 Claims**

1. A process for the preparation of screen printing stencils which comprises coating a metallic matrix, provided in screen-like arrangement with dots of insulating material, with a photoresist layer, exposing the photoresist layer imagewise, thereafter rendering the surface of the photoresist layer electrically conductive by the application of conductive particles, subsequently developing the photoresist layer by washing out, electrodepositing metal up to a desired height on the conductive image stencil and on the matrix ridges surrounding the insulating screen dots, and removing the patterned screen printing stencil thus obtained from the matrix.



4,401,521
METHOD FOR MANUFACTURING A FINE-PATTERNED THICK FILM CONDUCTOR STRUCTURE

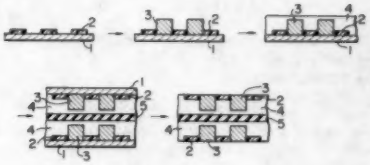
Kaoru Ohmura; Ryohei Koyama, and Takeo Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1981, Ser. No. 323,337

Claims priority, application Japan, Nov. 28, 1980, 55-166614; Jun. 16, 1981, 56-91479

Int. Cl.³ C25D *1/00, 1/20*

U.S. Cl. 204—12 **21 Claims**



1. A method for manufacturing a fine-patterned thick film conductor structure comprising the steps of:

(a) forming a resist on a thin metal plate at areas other than land areas and electroplating said land areas using said thin metal plate as a cathode electrode to form conductors having a circuit density of no less than 3 lines/mm and a film thickness of 15–200 μm, the cathode current density in the electroplating to said thin metal plate being between 0.05 and 2 A/dm² until the film thickness reaches 0.3–10 μm, and thereafter increasing to 3–50 A/dm²;

(b) bonding said electroplated thin metal plate to an insulative substrate with the thin metal plate side facing up, and

(c) etching away said thin metal plate.

4,401,522
PLATING METHOD AND APPARATUS

Adolph G. Buschow, Largo, and Charles D. Eidschun, Seminole, both of Fla., assignors to Micro-Plate, Inc., Clearwater, Fla.

Filed Sep. 29, 1980, Ser. No. 192,424

Int. Cl.³ C25D *5/02, 17/06, 17/28*

U.S. Cl. 204—15 **22 Claims**

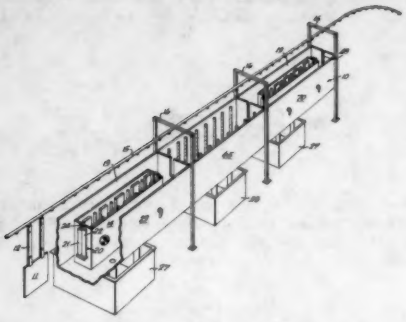
1. The method of continuous metal exchange for workpieces such as printed circuit boards in a tank comprising the steps of

conveyorizing the workpieces for comtinuous horizontal transport while the workpiece is in a vertical plane;

sealing the opposite ends of the tank while providing for passing the workpieces through the seal into and out of the tank;

rendering the workpieces conductive while in the tank;

and providing a fluid in the tank energized for metal exchange in intimate contact with the workpiece, whereby



plating or deplating or other forms of metal exchange can be continuously accomplished on the workpieces.

4,401,523

APPARATUS AND METHOD FOR PLATING METALLIC STRIP

Richard C. Avellone, Mayfield Heights, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 217,806, Dec. 18, 1980, which is a continuation-in-part of Ser. No. 22,618, Mar. 21, 1979, abandoned. This application May 19, 1982, Ser. No. 379,962

Int. Cl.³ C25D *5/02, 5/08, 7/06, 17/00*

U.S. Cl. 204—15 **24 Claims**

1. A system for electroplating a metallic workpiece with a plated coating, said system comprising:

(a) a plating electrode;

(b) drive structure for delivering the workpiece to a region proximate the electrode;

(c) circuitry couplable to a source of electric power for causing electric current flow between the workpiece and the electrode;

(d) apparatus for delivering plating fluid containing ions of the intended plating coating to a region between the electrode and the workpiece, and

(e) conditioning apparatus for applying plating coating ions to the workpiece surface prior to its delivery to the region of the electrode.

4,401,524

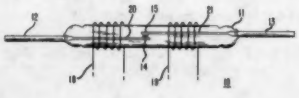
PROCESS FOR PRODUCING GOLD PLATED CONTACTS

Jacques A. Augis, Pickerington, and Erhard T. Eisenmann, Columbus, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 73,689, Sep. 10, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 277,859

Int. Cl.³ C25D *5/50*

U.S. Cl. 204—37 R **11 Claims**



1. A process for producing electrical contacts comprising heat treating of a gold electroplated surface in which the gold electroplated surface is fabricated by electroplating a gold film on a substrate consisting essentially of remendur from an aqueous solution containing gold and cyanide with pH between 3 and 5

CHARACTERIZED IN THAT the heat treatment of the gold electroplated surface is carried out in a reducing atmosphere at a temperature of approximately 350 degrees C. for between one minute and three hours so as to produce a spongy gold contact surface without affecting the magnetic properties of the remendur.

4,401,525

PROCESS FOR COLORING ALUMINUM ELECTROLYTICALLY WITH METAL SALTS

Erich Ruf, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 93,990

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850136

Int. Cl.³ C25D *11/22*

U.S. Cl. 204—42 **4 Claims**

4. In a process for electrolytically coloring aluminum with metal salts wherein by means of a direct current in an acidic solution, a refined oxide layer is produced on the aluminum and the layer is subsequently colored by means of an alternating current using an acidic electrolyte which contains tin(II) salts, the improvement which comprises said electrolyte also containing 1 to 10 g/l of one or more iron(II) salts of sulfonic acids with a maximum of 8 carbon atoms or of sulfamic acid and free sulfosalicylic acid or free sulfophthalic acid.

4,401,526

ZINC ALLOY PLATING BATHS WITH CONDENSATION POLYMER BRIGHTENERS

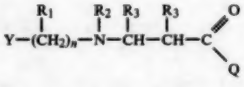
Sylvia Martin, Detroit, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed May 24, 1982, Ser. No. 381,089

Int. Cl.³ C25D *3/56*

U.S. Cl. 204—43 Z **21 Claims**

1. An aqueous zinc alloy electroplating bath having a pH of from about 0 up to about 8.9 and comprising a conductive aqueous solution containing zinc ions, alloying metal ion selected from the group consisting of nickel ions, cobalt ions and mixtures thereof, and a brightening amount of a brightening additive selected from the group consisting of a monomer of the following general formula and polymers thereof:



wherein:

n is from 1 to about 6;

Y is —OX, —NX_2, —SO_3H, —SO_3M, —COOH, —COOM, —SX, or —CN;

X is H, or an alkanol, alkamine, sulfoalkyl, carboxyalkyl, hydroxyaryl, sulfoaryl, carboxyaryl, or aminoaryl having from 1 to about 10 carbon atoms;

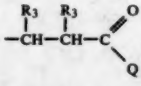
M is H, Li, Na, K, Be, Mg or Ca;

Q is —OR_4, —$N(R_4)_2$, —OZ, —OM, or halogen;

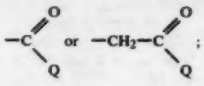
Z is an aryl group or a substituted aryl group having from about 6 to about 14 carbon atoms;

R_1 is H or an alkyl group having from 1 to about 4 carbon atoms;

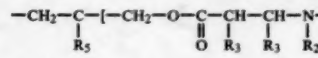
R_2 is H or an alkyl, alkanol, or alkamine group having from 1 to about 4 carbon atoms, or



R_3 is H or an alkyl group having from 1 to about 4 carbon atoms, phenyl, substituted-phenyl, or



R_4 is H or an alkyl, alkenyl, alkynyl, alkanol, alkenol, alkynol, keto alkyl, keto alkynyl, keto alkenyl, alkamine, alkoxy, polyalkoxyl, sulfoalkyl, carboxyalkyl, mercapto alkyl, or nitriloalkyl group having from 1 to about 12 carbon atoms, phenyl or substituted phenyl or



R_5 is H, —OH, or a hydroxyalkyl group having from 1 to about 4 carbon atoms;

r is 1 to about 3;

and mixtures thereof.

4,401,527

PROCESS FOR THE ELECTRODEPOSITION OF PALLADIUM

Robert Duva, Paramus, and Linda J. Mayer, Denville, both of N.J., assignors to Occidental Chemical Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 68,134, Aug. 20, 1979, abandoned. This application Aug. 20, 1981, Ser. No. 294,668

Int. Cl.³ C25D *3/50*

U.S. Cl. 204—47 **5 Claims**

1. A process for the electrodeposition of palladium which comprises electrolyzing an aqueous plating bath which has a pH of from 6.5 to 7.5 and which contains a bath-soluble palladium compound, an electrolyte compound, and a nitrite compound in an amount sufficient to provide an excess of free nitrite ions relative to the palladium ions in the bath, by passing an electric current through said bath, between an anode which is insoluble in the bath and a cathode, at a current density of at least 5 A/dm^2, and continuing said passage of current while maintaining said excess of free nitrite ions in the bath until the desired electrodeposition of palladium is obtained on the cathode.

4,401,528

PROCESS FOR PREPARING 2-OXYCEPHALOSPORIN DERIVATIVES

Sigeru Torii; Hideo Tanaka; Junzo Nokami; Takashi Shiroi, all of Okayama; Norio Saito, Tokushima, and Michio Sasaoka, Okayama, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

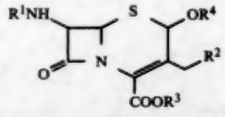
Filed Aug. 12, 1982, Ser. No. 407,328

Claims priority, application Japan, Aug. 25, 1981, 56-133774

Int. Cl.³ C25B *3/02*

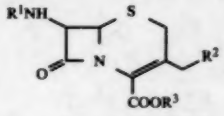
U.S. Cl. 204—78 **8 Claims**

1. A process for preparing 2-oxycephalosporin derivative represented by the formula



(I)

wherein R^1 represents hydrogen atom, acyl group, or lower alkoxycarbonyl group optionally substituted with halogen atom, R^2 represents hydrogen atom, halogen atom or acyloxy group optionally substituted with halogen atom, R^3 represents hydrogen atom, lower alkyl group optionally substituted with halogen atom, or phenyl-lower alkyl group which may be optionally substituted with nitro group, halogen atom or lower alkoxy group on the phenyl ring, and R^4 represents lower primary or secondary alkyl or lower alkylcarbonyl, the process comprising electrolytically oxidizing a cephalosporin derivative represented by the formula



(II)

wherein R^1, R^2 and R^3 are as defined above, in the presence of a lower carboxylic acid or lower primary or secondary alcohol, and a supporting electrolyte.

4,401,529

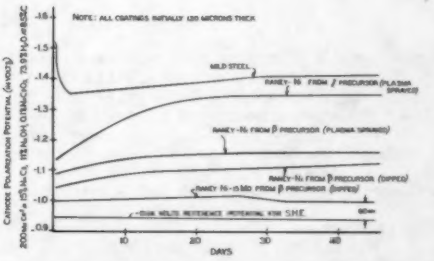
RANEY NICKEL HYDROGEN EVOLUTION CATHODE

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 334,058, Dec. 23, 1981, which is a continuation of Ser. No. 179,150, Aug. 18, 1980, Pat. No. 4,370,361, which is a division of Ser. No. 25,153, Mar. 29, 1979, Pat. No. 4,240,895. This application May 20, 1982, Ser. No. 380,154

Int. Cl.³ C25B *1/26, 1/46, 1/04, 1/06*

U.S. Cl. 204—95 **44 Claims**


NOTE: ALL COATINGS INITIALLY 120 MICRONS THICK
MILD STEEL
RANEY-Ni FROM γ PRECURSOR (PLASMA SPRAYED)
RANEY-Ni FROM β PRECURSOR (PLASMA SPRAYED)
RANEY-Ni FROM β PRECURSOR (DIPPED)
RANEY Ni-15 Mo FROM β PRECURSOR (DIPPED)
CATHODE POLARIZATION POTENTIAL (-V vs SCE)
DAYS

1. A method of generating hydrogen from a hydrogen evolution cathode in an electrolytic cell by passing an electric current through an aqueous electrolyte between an anode and a hydrogen evolution cathode, said cathode being comprised of a monolithic structure having a surface formed from an integral precursory, adherent Raney Beta phase ternary alloy represented by the formula $Ni_xMo_yAl_3$, where x is the weight percent of nickel and y is the weight percent of molybdenum, in the combined weight of nickel and molybdenum, and where x ranges from about 80 to about 95 percent by weight, and y ranges from about 20 to about 5 percent by weight, and which has had from about 75 to about 95 percent of the aluminum leached from said surface with a strong aqueous base so as to form an active porous Raney Beta phase nickel-molybdenum surface layer whereby the hydrogen overvoltage of said surface is reduced.

4,401,530

ELECTRODE

Thomas M. Clere, Willowick, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

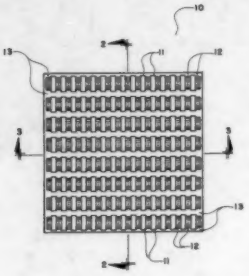
Filed Sep. 28, 1981, Ser. No. 306,071

Int. Cl.³ C25B *1/34, 9/00*

U.S. Cl. 204—98 **8 Claims**

5. In a process for electrochemically producing chlorine and caustic soda by passing current through a brine solution in an electrolytic membrane-type cell the improvement comprising utilizing at least one integral, three-dimensional electrode

having a substantially planar sheet-like portion and rows of curved portions protruding therefrom; said rows alternating said protruding curved portions above and below the surface of said substantial planar sheet-like portions; said three-dimensional electrode thereby having a geometric configuration



offering in one sectional aspect the appearance of a series of oblate spheroids interruped by said planar sheet-like portion and in another sectional aspect, 90° from said one aspect, the appearance of a square wave pattern; said sections being taken through the plane of the planar sheet-like portion.

4,401,531

PROCESS FOR THE PRODUCTION OF ELECTROLYTIC ZINC OR HIGH PURITY ZINC SALTS FROM SECONDARY ZINC RAW-MATERIALS

Daniel Martin San Lorenzo, Brujula 5, Torrejon de Ardoz; Jose M. Regife Vega, San Ernesto 12, and Eduardo D. Nogueira, Avda. del Mediterraneo 47, both of Madrid, all of Spain

Filed Jun. 30, 1982, Ser. No. 393,947
Claims priority, application Spain, Jul. 24, 1981, 504.250
Int. Cl.³ C25C 1/16
U.S. Cl. 204—114 **16 Claims**

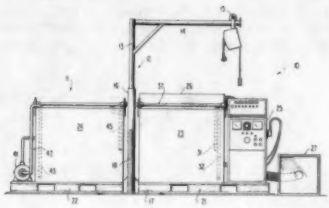
1. A process for the production of either electrolytic zinc or high purity zinc salts from secondary zinc raw materials which comprises: leaching said raw material in a slightly acid aqueous solution at controlled pH, separating the reaction mixture into a leaching liquor containing the leached zinc and a solid residue which after suitable washing is discarded; directing the zinc-bearing liquor to a solvent extraction facility where it is brought into contact with an organic solution containing organic acids as cationic extraction reagents, by means of which, an ion exchange of zinc by hydrogen ions is achieved, resulting in a zinc loaded organic solution and in an aqueous solution containing the stoichiometric acidity to the extracted zinc; recycling the acid aqueous raffinate to the previous leaching step where it is used as the slightly acid aqueous solution to carry-out the zinc leaching from the raw material; sending the zinc organic extract to a stripping facility where it is brought into contact with a strong acid solution of zinc sulphate, by means of which an ion exchange of zinc by hydrogen ions takes place, thus producing a concentrated solution of zinc sulphate and an organic solution free of zinc, which is recycled back to the previous step to perform the zinc extraction; directing the concentrated zinc sulphate aqueous solution either to an elctrowinning facility to produce electrolytic zinc, or to a crystallisation plant for the production of pure zinc sulphate; recycling back to the previous step of zinc stripping either the spent electrolyte from the electrowinning facility or the mother liquors from the crystallisation plant to form, after suitable sulphuric acid make-up, the strong acid solution of zinc sulphate, by means of which zinc stripping from the organic extract is achieved.

4,401,532

RADIOACTIVE DECONTAMINATION APPARATUS AND PROCESS

Opha L. Jackson, P.O. Box 1627, Brooksville, Fla. 33512

Filed May 28, 1981, Ser. No. 267,981
Int. Cl.³ C25F 3/16, 7/00
U.S. Cl. 204—129.1 **12 Claims**



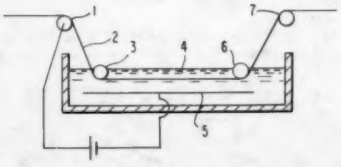
1. Decontamination apparatus including an electro-polishing tank assembly, said assembly comprising:
an electro-polishing tank for holding an electrolyte fluid,
a pair of swinging arms attached to said electro-polishing tank but electrically isolated therefrom,
a pair of metal probes detachably attached to said pair of swinging arms and extending down into an electrolyte fluid in said electro-polishing tank,
a metal support extending across the top of said electro-polishing tank but electrically isolated therefrom, and
a DC power supply having positive and negative terminals, said positive terminal being connected to said metal support and said negative terminal being connected to said pair of metal probes,
whereby an object to be decontaminated is suspended, with good electrical contact, from said metal support into an electrolyte fluid in said electro-polishing tank and said pair of metal probes are then moved on said swinging arms to a close proximity to said object, without making contact.

4,401,533

SURFACE-TREATMENT OF CARBON FIBER

Kazuhisa Saito; Hiroyasu Ogawa, and Tetsuro Shigei, all of Shizuoka, Japan, assignors to Toho Belson Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,669
Claims priority, application Japan, Mar. 5, 1980, 55-27720
Int. Cl.³ C25F 1/00
U.S. Cl. 204—130 **11 Claims**



1. A method for surface-treating high strength carbon fiber comprising passing an electrical current through the carbon fiber in an aqueous solution of a sulfate under conditions such that the current density is from about 0.05 to 0.5 amps/meter^2 (A/m^2), and the product of the current density, voltage (V), and processing time (min) is from about 0.02 to 8 A-V-min/m^2, while continuously moving the carbon fiber as an anode in the aqueous solution, wherein the high strength carbon fiber has a

tensile modulus of from about 20,000 to 28,000 Kg/mm^2 and a tensile strength of at least about 250 Kg/mm^2.

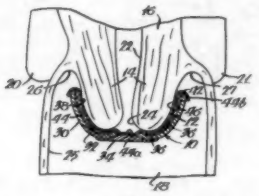
11. A carbon fiber exhibiting excellent adhesive properties to resins and having high strength and heat-oxidation resistance produced by a method comprising passing an electrical current through the carbon fiber in an aqueous solution of a sulfate under conditions such that the current density is from about 0.05 to 0.5 amps/meter^2 (A/m^2), and the product of the current density, voltage (V), and processing time (min) is from about 0.02 to 8 A-V-min/m^2, while continuously moving the carbon fiber as an anode in the aqueous solution, wherein the high strength carbon fiber has a tensile modulus of from about 20,000 to 28,000 Kg/mm^2 and a tensile strength of at least about 250 Kg/mm^2.

4,401,534

CONFORMING VALVED CERVICAL CAP ASSEMBLY AND IN-SITU MOLDING METHOD

Robert A. Goepp, Chicago; Uwe E. Freese, Oak Park, and Marvin P. Loeb, Chicago, all of Ill., assignors to University Patents, Inc., Norwalk, Conn. and Contracap, Inc., Schaumburg, Ill.

Filed Nov. 18, 1980, Ser. No. 207,904
Int. Cl.^{3} B29C *23/00*; A61F *5/46*
U.S. Cl. 264—138 **19 Claims**



11. A method of forming a cervical cap assembly, comprising the steps of:

providing a flexible, non-porous shell having a concave inner surface defining an aperture and one-way valving means for permitting egress of uterine discharges but preventing ingress of sperm;

providing liquid impervious covering means including a flexible, non-porous, wettable liner sheath;

providing a material which is moldable and curable at about body temperature;

attaching said covering means about said valving means from within said shell;

covering said aperture with said covering means to substantially prevent said curable material from entering into said aperture;

spacing said liner sheath along said concave inner surface of said shell to form a material-receiving pocket between said concave inner surface and said liner sheath;

introducing said curable material into said pocket;

positioning the resulting assembly onto the cervix uteri; and

molding and curing said material in said pocket in situ adjacent the exocervical surface, and while the exocervical surface is in an undistorted configuration, to generally conform to and matingly fit said exocervical surface.

4,401,535

PHOTOCHEMICAL METHOD OF PREPARING DIHYDROCARBYL MERCAPTOHYDROCARBYL PHOSPHONATES AS SILICA-TO-RUBBER COUPLING AGENTS

Gary D. MacDonell, and Carl J. Stacy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 147,404, May 6, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,491
Int. Cl.^{3} B01J *19/12*
U.S. Cl. 204—158 R **2 Claims**

1. A method for the preparation of a dihydrocarbyl mercaptohydrocarbylphosphonate which comprises reacting a trihydrocarbylphosphonate with hydrogen sulfide; wherein actinic light is employed to cause the reaction.

4,401,536

BIOCOMPATIBLE, STEAM-STERILIZABLE IRRADIATED ARTICLES COMPRISED OF ETHYLENE COPOLYMER AND POLYPROPYLENE BLENDS

Edwin O. Lundell, North Plainfield, and George T. Kwiatkowski, Green Brook, both of N.J., assignors to Delmed, Inc., Canton, Mass.

Continuation of Ser. No. 65,411, Aug. 10, 1979. This application Jan. 23, 1981, Ser. No. 227,752
Int. Cl.^{3} C08L *23/26*; A61J *1/00*
U.S. Cl. 204—159.2 **6 Claims**

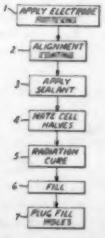
1. A semi-rigid biomedical article for use in handling vital fluids consisting essentially of a blend of about 20–50% medical grade radiation stabilized polypropylene by weight, the balance being a copolymer of ethylene and a comonomer selected from the group consisting of (i) vinyl esters of saturated carboxylic acids having up to 8 carbon atoms in the acid moiety, and (ii) alkyl ester of α,β ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms in the acid moiety and from 2 to 8 carbon atoms in the alkyl moiety said comonomer comprising about 1–15 mole percent of the copolymer, said article having been irradiated to a dose of ionizing radiation ranging from about 1 to 35 Mrad; steam sterilized; and heat-sealed; said blend being free of toxic amounts of migratable components and possessive of flexibility, tensile and impact strengths suited for handling vital fluids.

4,401,537

LIQUID CRYSTAL DISPLAY AND PHOTOPOLYMERIZABLE SEALANT THEREFOR

Mao-Jin Chern, Rancho Palos Verdes, Calif., and Robert D. Lowrey, Aitkin, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 973,149, Dec. 26, 1978, Pat. No. 4,297,401. This application Jul. 2, 1981, Ser. No. 280,108
Int. Cl.^{3} C09K *3/34*
U.S. Cl. 204—159.11 **7 Claims**



1. A photopolymerizable, adhesive, sealant composition comprising:

(a) cationically polymerizable epoxide with a functionality of at least 1, and

(b) an organic aromatic onium catalyst comprising an aromatic adduct of

(1) a diaromatic, triaromatic, or tetraaromatic organoatomic cation of a Group Va, VIa, or VIIa atom and

(2) an anion;

said onium catalyst being represented by the formula:

$$(R^2)_n-\underset{\displaystyle (R^1)_a}{\overset{\displaystyle |}{A}}{}^{+}X^{-}$$

wherein

R^2 is an aromatic group at least as electron withdrawing as benzene,

R^1 is an alkyl or alkenyl group,

A is a Group Va, VIa, or VIIa atom,

X is an anion,

n is a positive whole integer of at least 2 up to the valence of A plus one,

a is 0 or a positive whole integer up to the valence of A minus one, and

n plus a is equal to the valence of A plus one and wherein at least two of said R^2 groups are bonded to A, and

(c) an adhesion-aiding amount of glycidoxypropyl triethoxy silane or its precondensate.

4,401,538

ISOELECTRIC FOCUSING TECHNIQUES AND DEVICES

A. David Hausfeld, 1833 S. Ocean Dr., Hallandale, Fla. 33009

Filed Jun. 2, 1981, Ser. No. 269,478

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—180 P **12 Claims**

1. An apparatus for establishing an ion concentration gradient in an electrolyte containing two or more types of ions, said apparatus comprising, in combination:

a channel defined by at least one bounding surface suitable for containing said electrolyte; and

anode means and cathode means disposed in fluid communication with said electrolyte for establishing an electric field within electrolyte contained in said channel;

wherein at least a portion of said bounding surface is selectively permeable to the ions of said electrolyte contained in said channel, and is disposed and constructed such that electric lines of force of said electric field pass therethrough while a substantial component of said field is parallel to said bounding surface.

4,401,539

SPUTTERING CATHODE STRUCTURE FOR SPUTTERING APPARATUSES, METHOD OF CONTROLLING MAGNETIC FLUX GENERATED BY SAID SPUTTERING CATHODE STRUCTURE, AND METHOD OF FORMING FILMS BY USE OF SAID SPUTTERING CATHODE STRUCTURE

Katsuo Abe, Yokosuka; Shigeru Kobayashi, Kawasaki; Tsuneaki Kamei, Kanagawa; Hideki Tateishi, and Susumu Aiuchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,858

Claims priority, application Japan, Jan. 30, 1981, 56-11682; Jun. 29, 1981, 56-99659; Jun. 29, 1981, 56-99660

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **40 Claims**

1. A cathode structure for planar magnetron sputtering apparatuses comprising:

a target plate made of a material to be sputtered and having first and second main surfaces, said first main surface of said target plate facing a main surface of a sample substrate with a predetermined spacing therebetween, said material being deposited on said main surface of said sample substrate,

magnetic flux generating means provided on the side of said second main surface of said target plate for generating magnetic flux having a certain flux density and a certain distribution in an empty space between said sample substrate and said first main surface of said target plate, said magnetic flux generating means including main magnetic flux generating means and magnetic flux distribution control means in such a manner that said main magnetic flux generating means and said magnetic flux distribution control means form a united magnetic flux source, said main magnetic flux generating means including one or a plurality of first pole portions and one or a plurality of first magnetic flux path means, said magnetic flux distribution control means including a plurality of second pole portions and a plurality of second magnetic flux path means, one end of said one or a plurality of first pole portions lying in close vicinity to or being kept in contact with said second main surface of the target plate with a predetermined magnetic polarity, the other end of the one or a plurality of first pole portions being kept in contact with and magnetically connected to said first magnetic flux path means, one end of each of said second pole portions lying in close vicinity to or being kept in contact with said second main surface of the target plate, the other end of each second pole portion being kept in contact with and magnetically connected to said second magnetic flux path means, said first magnetic flux path means and said second magnetic flux path means being magnetically connected to each other, thereby said magnetic flux density and said magnetic flux distribution formed in said empty space by said magnetic flux generating means being controlled by said magnetic flux control means; and electric field applying means having first and second electrodes and a power source for establishing an electric field in said empty space, said first electrode being provided on the side of said second main surface of the target plate in such a manner that said first electrode lies in close vicinity to or is kept in contact with said second main surface, said second electrode being provided in said empty space and spaced apart from said first electrode, said power source supplying electric power to said first and second electrodes.

4,401,540

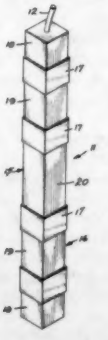
APPARATUS FOR REDUCING END EFFECT IN ANODES

Joe F. Tatum, and Thomas H. Lewis, both of Hattiesburg, Miss., assignors to C.E. Equipment Co., Inc., Hattiesburg, Miss.

Filed Oct. 29, 1980, Ser. No. 201,949

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—196 **18 Claims**



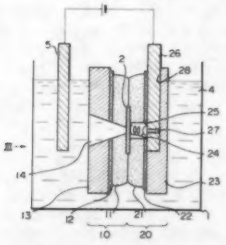
1. Apparatus for reducing the end effect phenomena in

anodes used in an impressed current cathodic protection system for underground metallic structures comprising an anode located within a cavity in the earth, said anode having an elongated body of electrical current conduction material, said body having a predetermined thickness, a pair of first nonconducting segments disposed on and around said body and spaced inwardly from opposite ends thereof and forming portions of the exterior surface of said body, the end surfaces of said body and the side surfaces of said body from the end surfaces to said first nonconducting segments defining first conducting segments of a first length, said first conducting segments having a length to thickness ratio of approximately two to one with respect to the thickness of said body, at least one pair of second nonconducting segments spaced inwardly along said body from said first nonconducting segments, the surfaces of said body between said first and second nonconducting segments defining second conducting segments of a second length which is greater than said first length, the surfaces of said body between said second nonconducting segments defining at least a third conducting segment of a third length which is greater than said second length, a carbonaceous material surrounding and in intimate engagement with the entire length of each of said conducting segments and communicating with the walls of the cavity in the earth, a lead wire electrically connected to said anode, and means for supplying an impressed current to said lead wire and said anode, whereby the length to thickness ratio of said first conducting segments causes the impressed current to be discharged therefrom as an electronic current and mutual interference between the first, second and third conducting segments causes the impressed current to be discharged as an electronic current from the remainder of the anode so that a substantially uniform electronic current density is discharged along the entire length of the anode into said carbonaceous material.

4,401,541
APPARATUS FOR ELECTROPLATING A STRIP OF METAL OF RELATIVELY LOW ELECTRIC CONDUCTIVITY

Masami Kobayashi, 3-13-15, Hachimanyama, Setagaya-ku, Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,751
Claims priority, application Japan, Nov. 25, 1981, 56-187788
Int. Cl.³ C25D *17/00, 17/12*
U.S. Cl. 204—206 **8 Claims**



1. An apparatus for electroplating a strip of metal of a relatively low electric conductivity, said strip being passed continuously through said apparatus and dipped in an electroplating solution so that it is partially electroplated at a predetermined width on one side along its length, said apparatus comprising:
anode means being adapted for electrically connecting said solution to a positive pole of an electric source;
means for masking said strip from said solution while allowing a part of said strip on said one side to contact said solution corresponding to the width to be electroplated;
and cathode means adapted to electrically connect said strip to a negative pole of the electric source, said cathode means comprising a plurality of contact elements which are disposed inside said masking means, each of said contact elements being arranged to contact said strip on the side which is not to be electroplated at positions opposite those where said solution contacts said strip and being connected to the electric source.

4,401,542
METAL FINISHING BARREL

Frank P. Zamiska, Cleveland, and Norman B. Tipton, Avon Lake, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

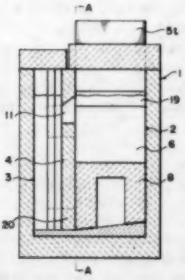
Filed May 28, 1981, Ser. No. 267,712
Int. Cl.³ C25D *17/04, 17/20*
U.S. Cl. 204—213 **15 Claims**

1. A metal finishing barrel, comprising:
(a) a sidewall extending between a pair of end caps, together defining an interior chamber for receiving products to be processed and including an opening through which products are loaded into said chamber including means for receiving and engaging a removable access door;
(b) said sidewall including at least two adjacent wall sections joined at a predetermined angle, said wall sections formed from a substantially continuous sheet member having an outside and an inside planar surface, said sheet bent along a line of weakness formed in said sheet; and
(c) self-locking reinforcing means coengaging portions of each wall section on either side of said line of weakness, for maintaining said wall sections at said predetermined angle.

4,401,543
ELECTROLYTIC CELL FOR MAGNESIUM CHLORIDE

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Sinagawa-ku, Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 325,036
Claims priority, application Japan, Dec. 11, 1980, 55-173839; Jul. 31, 1981, 56-121172
Int. Cl.³ C25C *3/04, 7/02*
U.S. Cl. 204—244 **20 Claims**



1. An improved electrolytic cell for magnesium chloride which essentially comprises: at least one pair of anode and cathode arranged with a respective principal face thereof in substantial verticality, at least one bipolar intermediate electrode placed in a row between the anode and cathode, an electrolytic chamber to contain such electrodes, and a metal collecting chamber which is attached to the electrolytic cham-

ber but separated therefrom by a partition, characterized in that said intermediate electrode essentially consists of a substantially flat graphite portion to provide an anodic face and an iron portion, which consists of several pieces, to provide a cathodic face, both of said materials being spaced from each other and joined together with rods of iron which are tightly secured to the graphite so as to ensure an intimate electrical connection therebetween, and that a cavity thus formed between the two materials is so arranged as to fitly communicate at one end with a through hole in the partition to allow passage of electrolyte bath carrying magnesium metal product from the electrolytic chamber to the metal collecting chamber.

4,401,544

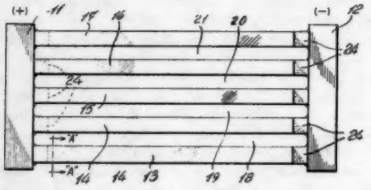
COMPOSITE ELECTRODES FOR DIAPHRAGMLESS ELECTROLYTIC CELLS FOR THE PRODUCTION OF CHLORATES AND HYPOCHLORITES II

Kin Seto, and Ian H. Warren, both of Vancouver, Canada, assignors to C-I-L Inc., North York, Canada

Filed Jun. 1, 1981, Ser. No. 268,742

Claims priority, application Canada, Jun. 10, 1980, 353846

Int. Cl.³ C25B *11/02, 11/10*

U.S. Cl. 204—288 **5 Claims**

1. An electrode assembly for use in diaphragmless electrolyte cells for the production of alkali metal chlorates and hypochlorites comprising:

(a) first and second base plates disposed in parallel relationship at a distance from each other;

(b) at least one row of equidistantly spaced apart finger-like metal cathodes projecting from the first base plate in the direction of but short of the distance to the second base plate, the cathodes in each row being in a same plane essentially perpendicular to the base plates; and

(c) for each row of finger-like metal cathodes, a corresponding coplanar row of finger-like metal anodes projecting from the second base plate in the direction of but short of the distance to the first base plate;

characterized in that the anodes and cathodes of corresponding coplanar rows of anodes and cathodes are interdigitated and are insulated from each other by a corresponding coplanar thin layer of non-electrically conductive insulating material.

4,401,545

ELECTRICALLY CONDUCTIVE POLYPYRROLE DERIVATIVES

Herbert Naarmann, Wattenheim; Dieter Naegele, Worms; Klaus Penzien, Frankenthal; Johannes Schlag, Ludwigshafen; Volker Kiener, Weisenheim, and Hugo Boehm, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Del.X

Filed Dec. 21, 1981, Ser. No. 332,839

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049551

Int. Cl.³ C25B *3/02;* H01B *1/00;* B01J *31/02;* H01M *4/60*

U.S. Cl. 204—291 **4 Claims**

1. An electrically conductive complex of a polypyrrole with a nitroaromatic anion.

4,401,546

FERROMAGNETIC HIGH SPEED SPUTTERING APPARATUS

Kyuzo Nakamura; Yoshifumi Ohta, and Taiki Yamada, all of Yachimata, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 25, 1982, Ser. No. 361,629

Claims priority, application Japan, Mar. 27, 1981, 56/44132; Mar. 27, 1981, 56/44133

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **3 Claims**

1. A ferromagnetic, high-speed sputtering apparatus comprising an evacuable chamber, a substrate in said chamber, a target of ferromagnetic substance in said chamber facing said substrate, said target serving as a cathode, and magnetic field developing means in said chamber on the side of said target opposite said substrate, said target comprising at least two separate segments of ferromagnetic substance which are spaced apart one from another by a gap so that a leakage magnetic field may be produced on a surface of the target facing said substrate.

4,401,547

POLAROGRAPHIC APPARATUS WITH DETACHABLE SAMPLE CHAMBER FOR MEASURING BLOOD GASES

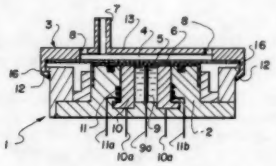
Manfred Schinkmann, and Hans-Jürgen Busack, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 23, 1980, Ser. No. 188,722

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938433

Int. Cl.³ G01N *27/48, 33/50*

U.S. Cl. 204—415 **6 Claims**



1. A test apparatus for measuring blood gases comprising a measuring head having a measuring electrode and a reference electrode arranged in said head, a first closure gas permeable membrane covering a portion of said head, and an attachment connectable to said head having a blood sample container space with a second gas permeable membrane surrounding said space being engaged over and in contact with said closure membrane.

4,401,548

REFERENCE ELECTRODE WITH INTERNAL DIFFUSION BARRIER

Donald P. Brezinski, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 12, 1981, Ser. No. 233,993

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—435 **8 Claims**

1. In a double junction electrode comprising

(a) a first housing containing an electrochemical half-cell being electrically connectable to an external measuring means and consisting essentially of a half-cell electrode and a half-cell electrolyte,

(b) a second housing containing a junction electrolyte,

(c) a half-cell junction allowing ionic conduction between said half-cell electrolyte and said junction electrolyte, and

(d) a reference junction allowing ionic conduction between said junction electrolyte and an external sample to be

measured, the improvement which comprises said half-cell junction comprising a microporous barrier material having a structure of sufficiently fine pore size such that exchange between half-cell and junction electrolytes is limited by diffusion, rather than by flow, characterized in

that, when said half-cell junction is saturated with 4 M KCl, the mathematical quotient of the liquid flow rate through said half-cell junction at 1 cm Hg pressure divided by the ionic electrical conductance of said half-cell junction is less than about 0·12 $ml.hr^{-1}mho^{-1}$.

4,401,549

LIQUEFACTION OF CALCIUM-CONTAINING COALS

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 17, 1981, Ser. No. 322,335
Int. Cl.³ C10G 1/00; C10L 1/04
U.S. Cl. 208—8 LE **9 Claims**

1. A process for liquefying a calcium-containing coal by converting said calcium to the harmless calcium thiosulfate form before liquefaction and removing said calcium thiosulfate from the liquefaction product effluent, which process comprises:

(a) contacting said calcium-containing coal with a sufficient amount of a sulfur oxide to convert substantially all of said calcium to calcium sulfite and to form an admixture comprising coal and calcium sulfite;

(b) contacting said coal, and calcium sulfite admixture with a sufficient quantity of hydrogen sulfide to convert said calcium sulfite to the corresponding calcium thiosulfate;

(c) liquefying at liquefication conditions said coal in a liquefaction zone to produce a liquefaction effluent stream comprising hydrocarbonaceous products and calcium thiosulfate without carbonate scale deposition problems; and

(d) removing said calcium thiosulfate from said hydrocarbonaceous products by contacting said effluent with an aqueous stream to dissolve said calcium thiosulfate in said aqueous phase and physically separating said aqueous phase from said hydrocarbonaceous product stream.

4,401,550

LIQUEFACTION OF CALCIUM-CONTAINING COALS

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 11, 1982, Ser. No. 338,737
Int. Cl.³ C10G 1/00; C10L 1/04
U.S. Cl. 208—8 LE **19 Claims**

1. A process for liquefying a calcium-containing coal feed stock by converting said calcium to a water soluble thiosulfate which comprises:

(a) contacting said calcium-containing coal with a quantity of an aqueous sulfur oxide solution sufficient to convert essentially all of said calcium to the corresponding calcium sulfite;

(b) contacting said coal, water and resultant calcium sulfite admixture from step (a) with a quantity of hydrogen sulfide sufficient to convert said calcium sulfite to the corresponding calcium thiosulfate, which becomes dissolved in said aqueous portion of said admixture;

(c) removing and physically separating said coal of step (b) from the aqueous portion of step (b) containing said calcium as the soluble thiosulfate; and then,

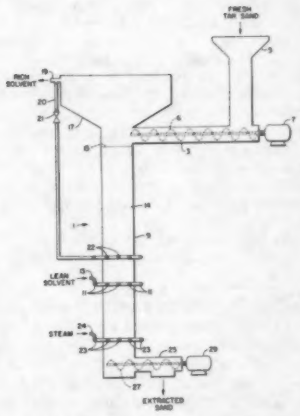
(d) liquefying the substantially calcium-free coal derived in step (c) in a liquefaction zone to obtain hydrocarbonaceous products without carbonate scale deposition problems.

4,401,551

SOLVENT EXTRACTION METHOD

David S. Mitchell, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 14, 1979, Ser. No. 75,624
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE **8 Claims**

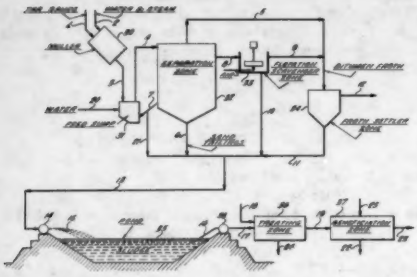


1. A method for extracting bitumen from bituminous sand comprising the steps of (a) maintaining a vertically extending bed of bituminous sand in a vertically extending extraction zone and introducing bituminous sand into an upper portion of said bed; (b) introducing a vaporizable liquid solvent having a boiling point below 275° C. into said upper portion of said bed; (c) providing a substantially continuous gaseous phase in contact with a lower portion of said bed; (d) maintaining a substantially continuous liquid phase comprising said solvent in contact with said upper portion of said bed above said gaseous phase, said liquid phase and said gaseous phase having an interface at a vertically intermediate level of said bed, extracting bitumen from said bituminous sand by passing said solvent through said upper portion of said bed, and removing a liquid including said solvent and bitumen from said extraction zone; (e) preventing said liquid phase from flowing downwardly through said lower portion of said bed by maintaining said gaseous phase at a pressure sufficient to support said liquid phase thereon, and vaporizing solvent adhering to solids in said lower portion of said bed; (f) removing said solids from said vessel from said lower portion of said bed; and (g) introducing into an intermediate level of said liquid phase bitumen previously extracted and removed from said extraction zone, and introducing at least a portion of said solvent into said liquid phase below said intermediate level of said liquid phase. pg.24

4,401,552
BENEFICIATION OF FROTH OBTAINED FROM TAR SANDS SLUDGE

Vythilingam Elanchenny, East Bradford, and Walter H. Seitzer, West Chester, both of Pa., assignors to Suncor, Inc., Toronto, Canada

Filed Apr. 13, 1981, Ser. No. 253,473
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—11 LE **4 Claims**



1. In the method of processing froth obtained by agitation and aeration of pond sludge recovered from a retention pond used to store tailings from water extraction of bitumen from tar sands, the improvement which comprises:

(a) diluting the froth feed with an amount of ambient temperature water effective to increase the concentration of bitumen in the upper layer of the froth;

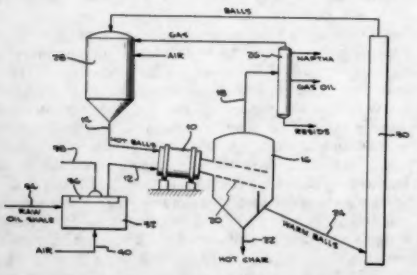
(b) vigorously agitating and aerating concurrently the resulting mixture, wherein the agitation is a high-shear agitation providing a Reynolds Number of higher than 10,000, whereby most of the bitumen contained in the froth feed is concentrated in an upper layer of the resulting product; and

(c) separating said upper layer of resulting froth product.

4,401,553
SYSTEM AND METHOD FOR LOWERED HYDROGEN SULFIDE EMISSIONS FROM OIL SHALE

Gerald B. Faudel, Concorde, Calif., assignor to Tosco Corporation, Los Angeles, Calif.

Filed Sep. 15, 1982, Ser. No. 418,274
Int. Cl.³ C10G *1/00*; C10B *57/00, 29/00*
U.S. Cl. 208—11 R **17 Claims**

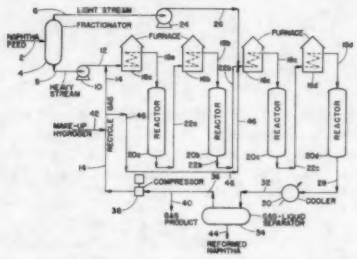


1. In a process for pyrolyzing carbonaceous material containing pyritic sulfur at a temperature at which said pyritic sulfur forms hydrogen sulfide which is emitted with the pyrolysis product gases and oils, wherein the improvement comprises reducing the formation of hydrogen sulfide by treating said carbonaceous material prior to pyrolysis with ultraviolet radiation in the presence of oxygen for a sufficient time to convert said pyritic sulfur to sulfate sulfur to form treated carbonaceous material and pyrolyzing the treated carbonaceous material wherein said sulfate sulfur does not form hydrogen sulfide at said pyrolysis temperature thereby reducing the amount of hydrogen sulfide emitted with said pyrolysis products.

4,401,554
SPLIT STREAM REFORMING

Byung C. Choi, Cherry Hill, and Kenneth R. Graziani, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,977
Int. Cl.³ C10G *35/04*
U.S. Cl. 208—64 **12 Claims**



1. A process for improving the BTX composition when reforming naphtha boiling hydrocarbons which comprises:

(a) separating a naphtha into a low boiling fraction and a high boiling fraction,

(b) contacting said high boiling fraction sequentially with a reforming catalyst situated in at least three reforming catalyst zones under effective reforming conditions and in the presence of hydrogen,

(c) introducing the low boiling fraction as part of the feed to the last or the penultimate of the reforming catalyst zones, and

(d) recovering from said last reforming catalyst zone a product effluent having a BTX composition substantially higher than if said naphtha were catalytically reformed with substantially the same catalyst under substantially the same reforming conditions.

4,401,555
HYDROCARBON CONVERSION WITH LOW-SODIUM CRYSTALLINE SILICATES

Stephen J. Miller, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 144,474, Apr. 28, 1980, Pat. No. 4,309,276.
This application Oct. 22, 1981, Ser. No. 313,561
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.³ C10G *11/05*
U.S. Cl. 208—111 **14 Claims**

1. A process for producing olefins from normal paraffins, slightly branched paraffins, and mixtures thereof, comprising contacting a feed which comprises said paraffins with a crystalline silicate having a uniform pore structure, having a pore size such that p-xylene can be adsorbed into said pore structure and o-xylene cannot, having a silica/alumina mole ratio greater than about 200:1, and containing less than about 0.1 weight percent sodium; and, producing an effluent of greater olefin content than said feed.

4,401,556

MIDBARREL HYDROCRACKING

Richard D. Bezman, White Plains, and Jule A. Rabo, Armonk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 93,586, Nov. 13, 1979, abandoned. This application Apr. 12, 1982, Ser. No. 367,783
Int. Cl.³ C10G 47/20
U.S. Cl. 208—111 2 Claims

1. In the method for selectively converting hydrocarbons boiling above about 700° F. to midbarrel fuel products boiling between about 300° and 700° F. which comprises reacting said hydrocarbons with hydrogen under hydrocracking conditions in the presence of a catalyst composition comprising a hydrogenation component and a crystalline aluminosilicate cracking component, the improvement which comprises utilizing as a cracking component a zeolite aluminosilicate having a SiO_2/Al_2O_3 molar ratio of from 4.5 to 35, the essential X-ray powder diffraction pattern of zeolite Y, an ion exchange capacity of not greater than 0.070, a unit cell dimension a_o of from 24.20 to 24.45 A, a surface area of at least 350 m^2/g (B-E-T), a sorptive capacity for water vapor at 25° C. and a p/p_o value of 0.10 of less than 5.00 weight percent and a Residual Butanol Test value of not more than 0.40 weight percent.

4,401,557

CATALYSTS FOR HYDROCARBON CONVERSION

Bernard Juguin, Rueil Malmaison; Germain Martino, Poissy, and Jean Miquel, Paris, all of France, assignors to Societe Francaise Des Produits Pour Catalyse, Rueil Malmaison, France

Filed Sep. 24, 1975, Ser. No. 616,123
Claims priority, application France, Sep. 25, 1974, 74 32576
Int. Cl.³ C10G 35/09; B01J 27/06
U.S. Cl. 208—139 42 Claims

1. A reforming process which comprises contacting a hydrocarbon fraction under reforming conditions in the presence of a catalyst containing a carrier and, by weight with respect to the catalyst carrier, (a) 0.005–1% of platinum, (b) 0.005–1% of rhodium or osmium, (c) 0.005–5% of an additional metal selected from the group consisting of chromium, tungsten, molybdenum, manganese, rhenium, gallium, indium, thallium, thorium, cerium, samarium, lanthanum, zinc, cadmium, titanium and zirconium, and (d) 0.1–10% of halogen.

6. A new catalyst comprising alumina and, by weight with respect to alumina, (a) 0.005–1% of platinum, (b) 0.005–1% of rhodium or osmium, (c) 0.05–3% of an additional metal selected from the group consisting of chromium, tungsten, molybdenum, manganese, rhenium, gallium, indium, thallium, samarium, zinc, cadmium, titanium and zirconium, and (d) 0.1–10% of halogen.

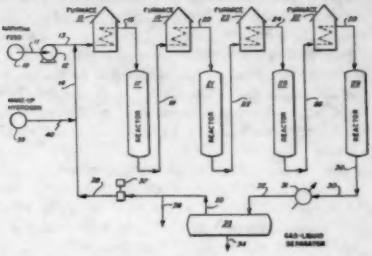
4,401,558

REFORMING WITH AN IMPROVED PLATINUM-CONTAINING CATALYST

Regis J. Pellet, Wheaton, Ill.; Ralph J. Bertolacini, Chesterton, Ind., and Donna L. Lysholm, Lisle, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 108,177, Dec. 28, 1979, Pat. No. 4,353,814. This application Nov. 5, 1981, Ser. No. 318,554
Int. Cl.³ C10G 35/085
U.S. Cl. 208—139 18 Claims

1. A process for the reforming of a hydrocarbon stream selected from the group consisting of naphthas and hydrocarbon fractions boiling in the gasoline boiling range, which process comprises contacting said hydrocarbon stream under reforming conditions and in the presence of hydrogen with a catalyst comprising a physical particle-form mixture of a Component A and a Component B, said Component A comprising one or more Group VIII noble metals and a combined halogen deposed on a refractory inorganic oxide and said Component B comprising a metal from Group IVB or Group VB of the



Periodic Table of Elements and a combined halogen deposed on a refractory inorganic oxide.

4,401,559

PROCESS FOR REMOVING HALOGENATED IMPURITIES FROM OLEFIN OLIGOMERS

Jean Gaillard, Lyon, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 21, 1982, Ser. No. 370,237
Claims priority, application France, Apr. 21, 1981, 81 08078
Int. Cl.³ C10G 17/04
U.S. Cl. 208—262 5 Claims

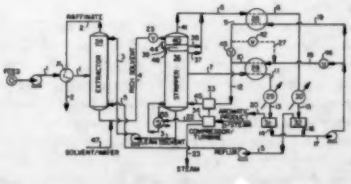
1. A liquid-liquid solvent extraction process for removing fluorine-containing compounds from an olefinic cut resulting from dimerizing or trimerizing at least one monoolefin having from 2 to 4 carbon atoms in the presence of a catalyst obtained by contacting a bivalent nickel compound with a hydrocarbyl aluminum halide and a trifluoroacetic acid, said process consisting essentially of intimately mixing said olefinic cut with an immiscible liquid phase of polar organic solvent selected from dimethylsulfoxide, acetonitrile, dimethylacetamide, dimethylformamide, diethylene glycol, dimethylsulfone, their mixtures and their mixtures with water, the proportion of polar organic solvent being from 0.01 to 10 parts by weight per part by weight of olefinic cut, to transfer said fluorine-containing compounds to said immiscible phase, and separating resultant purified liquid olefinic cut from said immiscible phase.

4,401,560

PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS FROM PETROLEUM FRACTIONS WITH HEAT RECOVERY

Jose A. Vidueira, White Plains; Paulino Forte, Yonkers, and Kenneth F. Butwell, Newburgh, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 1, 1982, Ser. No. 394,301
Int. Cl.³ C10G 21/16
U.S. Cl. 208—324 6 Claims



1. A continuous solvent extraction-steam-distillation process for the recovery of aromatic hydrocarbons in the range of C_6 to C_{16} from a feedstock containing aliphatic hydrocarbons in

the range of C_5 to C_{16} and said aromatic hydrocarbons, comprising the following steps:

(a) contacting the feedstock with a mixture of water and solvent in an extraction zone to extract aromatics from said feedstock and producing an aromatic rich solvent while the aliphatic portion of said feedstock passes out of the top of said extraction zone as a raffinate;

(b) passing said aromatic rich solvent to a flash zone wherein said aromatic rich solvent is let down to partially vaporize said aromatic rich solvent and to obtain an overhead vapor stream containing hydrocarbons, water and solvent traces;

(c) passing the unvaporized portion of said aromatic rich solvent from step (b) to a second flash zone wherein said aromatic rich solvent is further let down to partially vaporize said aromatic rich solvent and to obtain an overhead vapor stream containing hydrocarbons, water and solvent traces;

(d) passing the unvaporized portion of the aromatic rich solvent from step (c) to the top of a distillation zone;

(e) contacting the unvaporized aromatic rich solvent with a stream of steam in a distillation zone to further remove remaining heavy non-aromatic components from said aromatic rich solvent;

(f) combining the overhead vapor stream from the second flash zone in step (c), with the overhead vapor stream from the first flash zone obtained in step (b);

(g) passing a vapor stream of water and hydrocarbons from the top of the distillation zone into the vaporized overhead stream from said flash zones in step (f) prior to heat exchanging such combined stream;

(h) passing said combined overhead vapor stream from step (g) to a heat exchanger;

(i) heat exchanging said combined overhead vapor stream with a stream of water;

(j) condensing the combined overhead vapor stream of step (g) and dividing the condensate into a liquid hydrocarbon rich phase and a water rich phase;

(k) passing the liquid hydrocarbon rich phase from step (j) as reflux to the bottom of said extraction zone to displace non-aromatic impurities in said aromatic rich solvent with aromatics from said reflux;

(l) passing an aromatic rich solvent stream from the distillation zone to a reboiler in a heat exchange relationship with a vapor stream of steam;

(m) passing the partially vaporized hydrocarbon stream from step (l) back into said distillation zone;

(n) contacting said aromatic rich solvent stream at the bottom of the distillation zone with steam to remove substantially all aromatic hydrocarbons from said solvent stream thereby providing a lean solvent stream which is recycled to the extraction zone in step (a);

(o) removing aromatics, water, and a small amount of impurities from step (n) as a sidedraw product;

(p) heat exchanging the aromatics, water, and small amount of impurities from step (o) with a stream of water;

(q) condensing the overhead vapor stream of step (p) and dividing the condensate into a hydrocarbon rich phase and a water rich phase;

(r) combining the water rich phases from step (q) and step (j), and then passing a portion of the combined water stream through the heat exchanger in step (i) and the remaining portion through the heat exchanger in step (p);

(s) compressing the water vapor stream of step (r) after heat exchange with a turbine driven compressor; and

(t) passing said stream back into the distillation zone to provide steam for step (n);

(u) driving the turbine in step(s) with superheated steam;

(v) utilizing a portion of the superheated steam from step (u) to drive the reboiler in step (l);

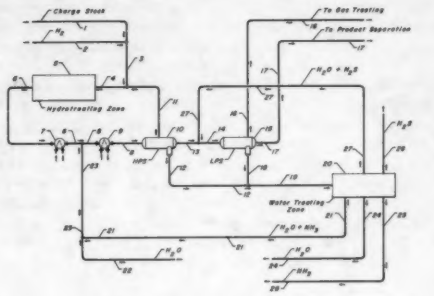
(w) utilizing the remaining portion of the superheated steam from step (u) in other parts of the refinery.

4,401,561

HYDROTREATING PROCESS WITH AMMONIA INJECTION TO REACTION ZONE EFFLUENT

H. Lytle Thompson, and Milton L. Kaplan, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 21, 1981, Ser. No. 333,085
Int. Cl.³ C10G 29/02
U.S. Cl. 208—212 **7 Claims**



1. A hydrotreating process which comprises the steps of:

(a) passing a feed stream which comprises hydrogen, sulfur-containing compounds and hydrocarbonaceous compounds into a hydrotreating reaction zone operated at conditions effective to produce a hydrotreating reaction zone effluent stream comprising hydrogen, hydrogen sulfide and hydrocarbonaceous compounds;

(b) admixing an aqueous stream containing an ammonia source in a quantity sufficient to provide at least 0.05 mole percent ammonia into the entire hydrotreating reaction zone effluent stream before any phase separation of said effluent;

(c) passing the entire hydrotreating reaction zone effluent into a first vapor-liquid separator to separate a hydrogen recycle stream, an aqueous stream containing ammonia and hydrogen sulfide and a first vapor-liquid separator effluent stream containing said hydrocarbonaceous products;

(d) recycling at least a portion of said hydrogen gas stream to said hydrotreating reaction zone;

(e) admixing an aqueous stream containing a hydrogen sulfide source into said first vapor-liquid separator effluent stream containing hydrocarbonaceous products;

(f) passing said admixture formed in step (e) to a second vapor-liquid separator to form an aqueous stream containing ammonia and hydrogen sulfide, a stream containing hydrocarbonaceous products and a vent gas stream;

(g) combining said aqueous streams of steps (c) and (f) and treating said streams in water treating zone to obtain:

i. an aqueous stream;

ii. an ammonia stream;

iii. a hydrogen sulfide stream;

iv. an aqueous stream containing said ammonia source which is used as at least a portion of said aqueous stream in step (b) augmented to said entire hydrotreating reaction zone effluent; and

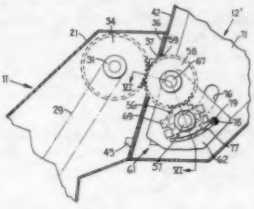
v. an aqueous hydrogen sulfide stream which is used as at least a portion of said aqueous hydrogen sulfide stream augmented to said process at a point intermediate said first vapor-liquid separator and said second vapor-liquid separator; and

(h) recovering said hydrotreated hydrocarbonaceous reaction products from step (f).

4,401,562
CONVEYOR-SEPARATOR WITH ADJUSTABLE SEPARATION GAP

Aristos G. Spugios, Kalamazoo, Mich., assignor to W-L Molding Company, Portage, Mich.

Filed Mar. 16, 1981, Ser. No. 244,518
Int. Cl.³ B07C 5/04
U.S. Cl. 209—615 12 Claims



1. In an apparatus for conveying and separating a mixture of plastic components, such as a mixture of molded plastic parts and runners, including:

a conveyor unit including a conveyor housing, a pair of horizontally spaced end rolls supported on the conveyor housing for rotation about substantially horizontal axes, an endless component-supporting conveyor belt extending between and supported on said end rolls, a drive motor, and drive transmission means drivingly connected between said motor and at least one said end roll for causing the upper reach of the belt to move from said first roll toward said second roll, said belt wrapping around said second end roll for permitting the components on the belt to be discharged into a gap disposed adjacent said second end roll, and said drive transmission means including a driving gear rotatably supported on said conveyor housing at the end thereof adjacent said second end roll;

a fingered separator unit for effecting separation of said runners from said parts, said separator unit being independent of said conveyor unit and including a separator housing which is separate from said conveyor housing, and means for fixedly and stationarily joining said separator housing to said conveyor housing adjacent said end thereof so that said separator unit cooperates with said second end roll for defining said gap therebetween;

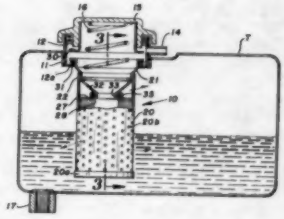
said separator unit including a plurality of support rollers rotatably supported on said separator housing for rotation about spaced but substantially parallel horizontal axes, an endless separating belt supported on and extending between said plurality of support rollers, said separating belt having a plurality of fingers mounted thereon and projecting transversely outwardly therefrom, said fingers being positioned at selected intervals both transversely and longitudinally of said separating belt so that the parts are sized to move between said fingers whereas the runners are caught by the fingers and carried along with the separating belt, a first said support roller being vertically spaced a substantial distance above and horizontally spaced from a second said support roller so that said separating belt includes an inclined reach which extends upwardly from said second support roller toward said first support roller, said inclined reach being disposed in opposed and adjacent relationship to said second end roll but being horizontally spaced therefrom for defining said gap therebetween, an idler gear rotatably supported on said separator housing at the end thereof adjacent said inclined reach, said idler gear being disposed in close proximity to but radially spaced relationship from one of said support rollers, said idler gear being meshingly connected with and rotatably driven by said driving gear when said separator and conveyor housings are joined together, and drive means drivingly connected between said idler gear and said one support roller for rotatably driving the latter to effect driving of said separating belt, said drive means including a driven wheel coaxially nonrotatably secured to said one support roller and drivingly connected with said idler gear;

the improvement comprising adjustable mounting means rotatably supporting thereon said one support roller for permitting the axis of said one support roller to be horizontally displaced relative to said separator housing so as to selectively adjust the horizontal gap between said inclined reach and said second end roll, said mounting means being movably supported on said separator housing for swingable movement of said one support roller relative to said separator housing about the axis of said idler gear while maintaining the driving connection between said idler gear and said driven wheel.

4,401,563
OIL FILTER CARTRIDGE FOR MOTORCYCLES

Douglas Koelfgen, 205 N River St., Delano, Minn. 55328

Filed Jul. 26, 1982, Ser. No. 401,530
Int. Cl.³ B01D 27/10
U.S. Cl. 210—130 4 Claims



1. An oil filter unit for insertion into and for use with engines that include an oil tank separate from the engine with flow means therebetween and including a receiving aperture in the tank into which the filter may be inserted and a closure cover for such aperture; said filter unit including:

a. a generally cylindrical, longitudinally extending housing having first and second ends;

b. said first end of said housing being closed;

c. perforations formed through said housing and extending substantially the entire longitudinal length thereof;

d. a filtering member of a length shorter than the longitudinal dimension of said housing and being received therein to receive oil to be filtered and providing a generally central, longitudinal passage for oil flow;

e. a radially extending closure member arranged on the inner periphery of said housing member and overlying in juxtaposition with said filtering member and having an aperture therethrough in alignment with said central passage of said filtering member;

f. said apertured closure member being arranged radially within said housing member to provide communication with a plurality of perforations through said housing longitudinally along said filtering member;

g. a generally conical, oil inlet member secured to the second end of said housing and extending inwardly, longitudinally therefrom having its discharge end positioned within said aperture of said closure member, the diameter thereof being less than the diameter of said aperture to provide an oil flow gap therebetween; and

h. a generally circular, resilient gap closure member received about said discharge end of said oil inlet member to normally seal the gap between said inlet member and said apertured closure member and being shiftable from said gap upon an increase in oil pressure within said housing to permit oil flow through said gap and through said perfora-

tions of said housing above said apertured member into the tank.

4,401,564

DEVICE FOR AFFIXING A FILTER MESH TO THE DRUM OF A ROTARY DRUM FILTER

Wolfgang Epper, Gergheim; Lothar Michalski, Wiehl, and Peter Schonteich, Cologne, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 3, 1981, Ser. No. 327,097

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048954

Int. Cl.³ B01D *33/34, 39/08*

U.S. Cl. 210—150 **6 Claims**

1. A device for affixing a thick, stiff one-piece filter mesh to the exterior of a drum of a rotary vacuum drum filter, said drum having a plurality of uniformly spaced support elements disposed about the circumference thereof and extending along the axial direction of said rum and forming individual cells beneath each support element, said filter mesh being trained about said support elements, said device comprising:

at least one planar clamping means disposed between at least alternating pair of adjacent support elements, each clamping element including a spacer element disposed between said drum wall and said filter mesh and attached to said drum wall, a strip disposed over said spacer element with said filter mesh disposed in between, and a retainer means for fastening said strip to said spacer element for holding said filter mesh in place without substantial deformation of said filter mesh, said spacer element having a height substantially equal to a height of said support elements.

4,401,565

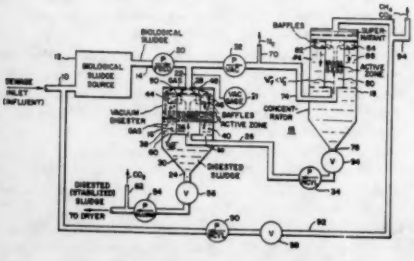
SYSTEMS FOR THE TREATMENT OF ORGANIC MATERIAL AND PARTICULARLY SEWAGE SLUDGE

Keith A. Schimel, 200 Ulster St., Apt. 1, Syracuse, N.Y. 13204

Division of Ser. No. 3,167, Jan. 15, 1979, abandoned. This application Jun. 2, 1980, Ser. No. 155,265

Int. Cl.³ C02F *11/04*

U.S. Cl. 210—258 **5 Claims**



1. The system for digestion of slurries of organic material which is useful for treatment of sewage sludge comprising a tank having outlets communicating with regions at opposite ends of said tank and an inlet means between said regions, means for continuously introducing the material to be treated into said tank via said inlet, means for establishing a pressure differential in said tank between said regions such that said material is maintained in suspension until substantially digested and mineralized and flows into one of said regions, said pressure differential establishing means comprising means connected to the outlet communicating with a first of said regions toward which said material flows from said inlet for establishing a vacuum pressure therein below atmospheric pressure, means for withdrawing said digested and mineralized sludge and gas via said outlets, pump means connected to said inlet means and with the outlet communicating with a second of said regions for continuously introducing said material to be treated and withdrawing against said vacuum said substantially digested material, means in said tank between said regions for providing a plurality of passageways for liquid flow between said regions, said inlet means being in communication with at least one of said passageways such that flow therein is toward said first region, means including baffles at one end of said passageways adjacent to said first region for deflecting liquid to flow in another of said passageways towards said second region thereby promoting the stripping of gas from said liquid, and said passageway providing means comprising a plurality of sheets of material of convolute configuration which define a honeycomb in a plane perpendicular to the length of said passageways, said one of said passageways being disposed longitudinally along the central axis of said tank, a plate disposed over and covering the end of said one passageway and passageways adjacent thereto, said baffles being plates dependent from said covering plate into said adjacent passageways, and wiers in the walls of said one passageway disposed opposite to said baffle plates for the flow of liquid between said on passageway and the passageways adjacent thereto having said baffle plates therein.

4,401,566

BODY FLUID-FILTERING DEVICE

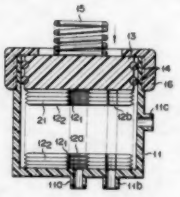
Akira Igari, Tokyo, and Tsutomu Murakami, Zama, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Jul. 18, 1981, Ser. No. 283,518

Claims priority, application Japan, Jul. 23, 1980, 55/100663; Jul. 23, 1980, 55/100664

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—351 **8 Claims**



1. A body fluid-filtering device which comprises:

a housing provided with a body fluid inlet, a filtrate outlet and a filtration residue outlet; and

filtering means disposed in the housing and including first and second filtering elements alternately superposed on each other with a space therebetween, the first filtering element being formed of a first meshed core material having openings whose size ranges between 700 and 1300 microns and filtering membranes covering both sides of said first core material, the second filtering element being formed of a second meshed core material having openings whose size is 300 microns or less and filtering membranes covering both sides of said second core material, said space between said filtering elements being in communication with the filtration residue outlet of the housing, and said filtering means being provided with at least one filtrate outlet therein which is in communication with the filtrate outlet of the housing;

wherein a body fluid entering the filtering device at the body fluid inlet of the housing is filtered by the filtering membranes of the first and second filtering elements, passes

through the first and second meshed core materials to the filtrate outlet of the housing, and the filtration residue is conducted through a space defined between the superposed filtering elements to the filtration residue outlet of the housing.

4,401,567

MICROPOROUS POLYETHYLENE HOLLOW FIBERS

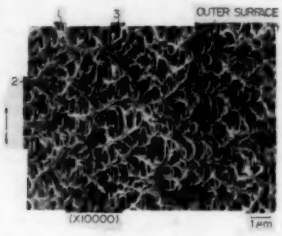
Mizuo Shindo; Takashi Yamamoto; Osamu Fukunaga, and Hisayoshi Yamamori, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,103

Claims priority, application Japan, Oct. 14, 1980, 55-143135

Int. Cl.³ B01D *39/00*; D02G *3/00*

U.S. Cl. 210—500.2 **9 Claims**



1. A high-density polyethylene microporous hollow fiber which is oriented in the lengthwise direction of the fiber, said hollow fiber having:
   (a) rectangular pores formed by microfibrils that are oriented in the lengthwise direction of the fiber and knotted portions that are connected to said microfibrils substantially at right angles thereto, the pores being contiguous with each other from the inner wall surface to the outer wall surface to form a stacked, multicellular structure;
   (b) a porosity of about 30 to about 90% by volume;
   (c) a water permeability through the wall of at least about 65 ($ml/m^2.hr.mmHg$); and
   (d) a human serum albumin permeability of at least about 30% as measured in a physiological saline solution.

9. A high-density polyethylene microporous hollow fiber membrane which is oriented in the lengthwise direction of the fiber, said hollow fiber membrane having:
   (a) rectangular pores formed by microfibrils that are oriented in the lengthwise direction of the fiber and knotted portions that are connected to said microfibrils substantially at right angles thereto, the pores being contiguous with each other from the inner wall surface to the outer wall surface to form a stacked, multicellular structure;
   (b) a porosity of about 30 to about 90% by volume;
   (c) a water permeability through the wall of at least about 65 ($ml/m^2.hr.mmHg$); and
   (d) a human serum albumin permeability of at least about 30% as measured in a physiological saline solution.

4,401,568

APPARATUS FOR PROCESSING FLUSHING LIQUOR FROM COKE OVENS

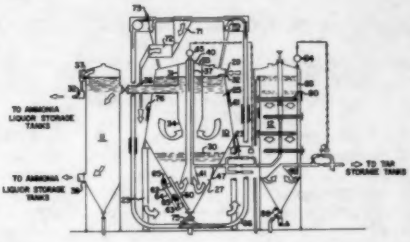
George R. Cain, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,127

Int. Cl.³ B01D *21/18*

U.S. Cl. 210—515 **9 Claims**

1. An apparatus comprising components designed, arranged and dimensioned for processing flushing liquor to separate it into one aqueous portion, a tar portion, and a solid portion, including:
   (a) a vertically elongated vessel having a cross-section that is variable with the vertical elevation;
   (b) flushing liquor inlet means adjacent the top of the vessel for receiving flushing liquor that contains tar and solids so as to form in said vessel a lower tar phase and an upper liquid phase such that a tar and liquid interface is formed between said phases;
   (c) clear liquor outlet means adjacent the top of the vessel and displaced from the inlet means for removing flushing liquor from the vessel;
   (d) means for removing tar at a selected location from the lower section of the vessel;



   (e) means for receiving solids from the bottom of the vessel;
   (f) a first vertical tube extending downwardly through the liquid phase and into the tar phase and a first lateral tube connecting with said first vertical tube to remove tar from the first vertical tube to the means for removing tar at a selected location from the lower section of the vessel; and
   (g) a second vertical tube extending downwardly into the liquid phase such that its lower end is upwardly spaced from the tar and liquid interface and a second lateral tube connecting with said second vertical tube to remove liquid from the second vertical tube to the clear liquor outlet means.

4,401,569

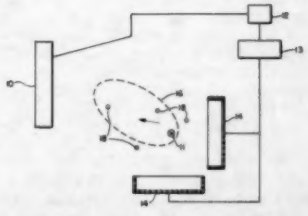
METHOD AND APPARATUS FOR TREATING HYDROCARBON AND HALOGENATED HYDROCARBON CONTAMINATED GROUND AND GROUND WATER

Vidyut Jhaveri, Highland Mills, N.Y.; Alfred J. Mazzacca, Rutherford, and Harold Snyder, Cliffside Park, both of N.J., assignors to Groundwater Decontamination Systems, Inc., Waldwick, N.J.

Filed Jul. 9, 1981, Ser. No. 281,773

Int. Cl.³ C02F *3/00*; C10G *32/00*

U.S. Cl. 210—610 **32 Claims**



1. A method of treating hydrocarbon-contaminated ground water to reduce the level of contamination comprising:
   (a) removing ground water from a location proximate to, and down gradient of ground water flow through, an area of ground containing hydrocarbon contamination;
   (b) treating the removed ground water with nutrients and

gases for a period of time sufficient to reduce the level of hydrocarbon contamination and to enhance the growth of hydrocarbon consuming microorganisms in the removed ground water, said nutrients and gases being suitable for enhancing the growth of hydrocarbon-consuming microorganisms and for reducing the level of contamination; and then;

(c) returning the treated water containing microorganisms, nutrients and gases to the ground at a position upgradient of ground water flow through the contaminated area toward said removal location; and

(d) adding gases into the ground of the contaminated area.

4,401,570

REMOVAL OF ORGANIC CONTAMINANTS FROM WASTE WATER

George C. Blytas, and Ronald K. June, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 26, 1982, Ser. No. 382,018
Int. Cl.³ C02F *1/26*
U.S. Cl. 210—639 **8 Claims**

1. A process for reducing the total organics content of an aqueous alkali waste stream containing at least one organic ester having insectidical properties selected from the group consisting of α-cyano-3-phenoxy-benzyl 2-(4-chlorophenyl)-3-methylbutanoate, α-cyano-3-phenoxybenzyl 2,2,3,3-tetramethyl cyclopropane carboxylate and α-cyano-3-phenoxybenzyl 2-(2,2-dichlorovinyl)-3,3-dimethyl cyclopropane carboxylate which process comprises

adjusting the pH of said stream in the range from about 2.5 to 5.5

extracting said stream with a C_5 to C_{10} hydrocarbon, by contacting in a volume ratio of hydrocarbon to water between about 0.2:1 and 5:1, and separating an aqueous product having a lower content of total organics and of said at least one organic ester than said waste stream.

4,401,571

METHOD FOR REMOVING LIQUIDS FLOATING ON WATER

Karl F. Ney, Hauptstrasse 15, Wolfsthal A-2412, Austria

PCT No. PCT/AT81/00015, § 371 Date Jan. 25, 1982, § 102(e) Date Jan. 25, 1982, PCT Pub. No. WO81/03656, PCT Pub. Date Dec. 24, 1981
PCT Filed Jun. 16, 1981, Ser. No. 346,040
Claims priority, application Austria, Jun. 16, 1980, 3172/80
Int. Cl.³ C02F *1/40*
U.S. Cl. 210—680 **12 Claims**

1. A method for removing a liquid floating on a water surface by in-situ formation of a water-resistant synthetic resin foam on the water surface, comprising the step of forming the foam around the liquid to be removed by curing, with a curing agent selected from the group consisting of di- and polyamines, a mixture containing a solvent-free liquid epoxy resin, 20–30%, by weight, based on the curing agent, of a silicon polymer with Si-H-groups as a foaming agent, 5–15%, by weight, based on the epoxy resin, of a resin improving agent selected from the group consisting of an alkyl phenol, a biphenol and a methylalkyl ketone, and 20–30%, by weight, based on the curing agent, of an accelerator.

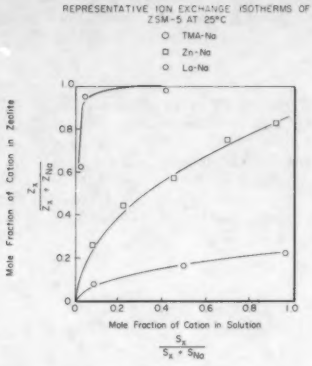
4,401,572

SELECTIVE ZEOLITE SORPTION OF GROUP V-B ELEMENT HYDRIDES AND DERIVATIVES THEREOF

Pochen Chu, West Deptford, N.J., and Francis G. Dwyer, West Chester, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 94,608, Nov. 15, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 274,971
Int. Cl.³ B01D *15/04*
U.S. Cl. 210—681 **11 Claims**

1. A method for selectively sorbing hydrides of Group V-B elements of the Periodic Chart of the Elements and derivatives thereof from an aqueous solution containing same which comprises contacting said solution under ion-exchange conditions



with a crystalline zeolite material having a pore dimension greater than about 5 Angstroms, a Constraint Index between 1 and 12 and a SiO_2/Al_2O_3 mole ratio greater than 12.

4,401,573

CONTINUOUS PROCESS FOR THE REMOVAL OF CHROMIUM FROM WASTE WATERS AND VALORIZATION OF THE RECOVERED CHROMIUM

Diego Perrone; Alberto Patrone, both of Cogoleto, and Elvio Caffarelli, Genoa, all of Italy, assignors to Luigi Stoppani S.p.A., Milan, Italy

Filed May 8, 1981, Ser. No. 261,885
Claims priority, application Italy, May 12, 1980, 21975 A/80
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—724 **12 Claims**

1. A process for removing Cr_2O_3 from waste waters comprising the steps of:

pretreating the waste water with at least 0.3% by weight acetic acid or acetate ion, and

adding an alkaline material selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonium hydroxide and magnesium oxide continuously to the pretreated waste waters at a temperature of between 40° C. and the boiling point, at atmospheric pressure, wherein the pH is maintained above 6.5,

wherein a sandy precipitate of chromium hydroxide is obtained which is separated from the waste water by filtering.

4,401,574

FLOCCULATION OF AQUEOUS PAINT WASTE

Thomas A. Farrington, Sparta, and Tamara Nowakowski, Boonton, both of N.J., assignors to Drew Chemical Corporation, Boonton, N.J.

Filed Jul. 21, 1981, Ser. No. 285,297
Int. Cl.³ C02F *1/52*
U.S. Cl. 210—728 **5 Claims**

1. In a process for clarifying latex paint waste water containing dispersed latex paint solids, the improvement comprising:

flocculating the latex paint solids with an effective flocculating amount of a poly aluminum chloride characterized by the following structural formula:

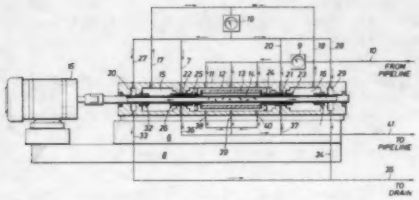
$$Al_n(OH)_mCl_{3n-m}$$

wherein n and m are integers and 3n is greater than m and the basicity as a percentage is from 30% to 83%.

4,401,575
BS AND W IN CRUDE OIL STREAMS

Thomas L. Stewart, Houston, and Florian C. Demay, Pasadena, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,598
Int. Cl.³ B01R 17/02
U.S. Cl. 210—746 10 Claims

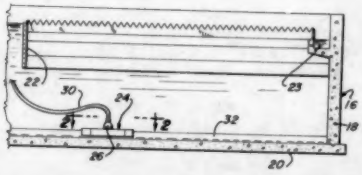


1. A process for measuring the water and sediment content of a wet stream which is predominantly non-aqueous, comprising, removing a sample of the wet stream, admitting the wet stream sample to an outer chamber containing an inner chamber having a wall formed of a filter, rotation the inner chamber while pressuring the wet stream sample from the outer chamber into the inner chamber, whereby sediment is filtered from the wet stream sample passing into the inner chamber and centrifugal force in the inner chamber forces water in the wet stream sample to remain in the outer chamber and thereby form a dry sample stream, passing the dry sample stream axially from the inner chamber to an aligned chamber which is separated from the outer chamber by at least two seals having a space therebetween, and passing at least a portion of the dry stream sample into the space between the seals.

4,401,576
SEDIMENT COLLECTING DEVICE

C. Lonnie Meurer, Englewood, Colo., assignor to Meurer Industries, Inc., Englewood, Colo.

Filed Dec. 29, 1980, Ser. No. 220,843
Int. Cl.³ B01D 21/06, 21/20
U.S. Cl. 210—803 17 Claims



1. A device for removing sediment adjacent a floor of a vessel containing a liquid, comprising:

first means for removing sediment contained in the vessel;

second means connected to said first means and positioned adjacent the floor of the vessel and substantially surrounded by the liquid for driving said first means in a stepping manner so that said first means removes the sediment adjacent the floor of the vessel as said first means is driven; and

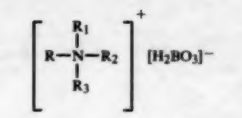
said stepping manner is defined by the movement of a portion of said second means relative to another portion of said second means.

4,401,577
QUATERNARY AMMONIUM DIHYDROBORATES IN FABRIC SOFTENER FORMULATIONS

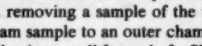
James M. Richmond, Naperville, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 190,550, Sep. 25, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,374
Int. Cl.³ D06M 13/18, 13/46
U.S. Cl. 252—8.8 9 Claims

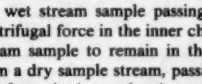
1. A fabric softening composition comprising between 2% and 6% of the compound of the formula:



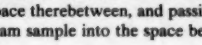
wherein R is selected from the class consisting of aliphatic radicals containing from about 6 to about 22 carbon atoms, a



group wherein R_5 is alkoxy containing from 6 to 22 carbon atoms and m is an integer of from 2 to 6, and a



group, wherein R_6 is alkyl containing from 1 to 20 carbon atoms, z is an integer of from 1 to 10 and each R′ is independently hydrogen or methyl; R_1 is independently selected from the class consisting of



groups, wherein x is an integer of from 1 to 20 and each R″ is independently hydrogen or methyl; R_2 is methyl or a group selected from the class represented by R_1; R_3 is a group selected from the class represented by R or R_2; and wherein said fabric softening composition further comprises 94% to 98% water.

4,401,578
CONCENTRATED FABRIC SOFTENING COMPOSITION

Martin W. Verbruggen, Humbeek, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 309,330, Oct. 6, 1981, which is a continuation of Ser. No. 110,144, Jan. 7, 1980, abandoned. This application Aug. 12, 1982, Ser. No. 407,520
Claims priority, application United Kingdom, Jan. 11, 1979, 7901137
Int. Cl.³ D06M 13/02, 13/20, 13/46, 13/16
U.S. Cl. 252—8.8 15 Claims

1. A fabric softening composition in the form of an aqueous dispersion comprising

(a) from 8% to 22% of a water-insoluble cationic fabric softener and

(b) from 0.5% to 4% of a viscosity control agent selected from the group consisting of:

(i) C_{10}–C_{20} non-cyclic hydrocarbons,

(ii) esters of C_9–C_{24} fatty acids with alcohols containing from 1–3 carbon atoms, and

(iii) C_{10}–C_{18} fatty alcohols,

wherein the ratio of (a) to (b) is from 5:1 to 20:1.

4,401,579
WATER-BASED METAL FORMING LUBRICANT COMPOSITION AND PROCESS

Terry L. Kratzer, Port Huron, Mich., assignor to Acheson Industries, Inc., Port Huron, Mich.

Filed Sep. 3, 1981, Ser. No. 299,171
Int. Cl.³ C10M *1/18, 1/26*
U.S. Cl. 252—17 **12 Claims**

1. A water-based lubricant composition, suitable for use in forging, and comprising:

(a) a first portion of a reaction product of about 2% to about 30% by weight fumaric acid and about 1% to about 20% by weight of an alkali metal or alkali earth metal hydroxide,

(b) a second portion comprised of modifiers of, about 0.2% to about 5% by weight of a water dispersible organic thickening agent, zero to about 1% by weight of a preservative agent, and

(c) the balance water.

4,401,580
LUBRICANT COMPOSITION CONTAINING AN ALKALI METAL BORATE AND AN ESTER-POLYOL COMPOUND

Kenneth Frost, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 182,535, Aug. 29, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,755
Int. Cl.³ C10M *1/26*
U.S. Cl. 252—25 **7 Claims**

1. A lubricant composition comprising an oil of lubricating viscosity having dispersed therein:

(a) 0.1 to 60 weight percent of a particulate hydrated alkali-metal borate and

(b) an effective amount of an ester-polyol compound to prevent the accumulation of seal damaging borate deposits.

4,401,581
NITROGEN-CONTAINING ASHLESS DISPERSANTS AND LUBRICATING OIL COMPOSITION CONTAINING SAME

Aubrey L. Burrows, Bracknell, England, and Thomas J. Walter, Baton Rouge, La., assignors to Edwin Cooper and Company Limited, Bracknell, England

Filed Mar. 15, 1982, Ser. No. 358,344
Claims priority, application European Pat. Off., Apr. 10, 1981, 81301589.8
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—51.5 A **13 Claims**

1. An ashless dispersant for use in lubricating oil, characterised in that said dispersant is the product of reacting at a temperature of from about 100° to 350° C.

(a) about 0.9 to 1.1 moles of a hydrocarbon-substituted succinic acid or anhydride wherein said hydrocarbon substituent has an average molecular weight of at least about 700,

(b) about 0.1 to 1.0 moles of an alcohol containing 1 to 6 hydroxy groups,

(c) about 0.01 to 0.5 moles of a primary or secondary hydroxy-substituted amine containing 1 to 3 hydroxy groups,

(d) about 0.01 to 2.5 moles of a hydrocarbyl succinimide or succinamide, and

(e) about 0.005 to 0.5 moles of a polyoxyalkylene amine having the structure

$$H_2N-R-(O-R)_m-NH_2 \text{ or } R_1[(O-R)_n-NH_2]_p$$

wherein R is a divalent aliphatic hydrocarbon group containing 2 to 4 carbon atoms, R_1 is a polyvalent saturated hydrocarbon radical having the valence p and containing 2 to 10 carbon atoms, m is an integer from 1 to 50, n is an integer from 1 to 40 such that the sum of all n's is from about 3 to 40 and p is an integer from 3 to 6,

wherein said hydrocarbyl succinimide or succinamide in (d) is the product made by reacting a hydrocarbyl succinic anhydride, acid, or ester with an amine containing 2 to 6 amino nitrogen atoms, at least one of which is primary, and about 1 to 30 carbon atoms, at least part of said hydrocarbyl succinimide or succinamide containing at least one reactive primary or secondary amine group.

9. An ashless dispersant as claimed in claim 1 further characterized in that it is made by a process comprising reacting in a first stage:

(a) about 0.9 to 1.1 moles of a hydrocarbon-substituted succinic acid or anhydride wherein said hydrocarbon substituent has an average molecular weight of at least about 700,

(b) about 0.1 to 1.0 moles of an alcohol containing 1 to 6 hydroxy groups, and

(c) about 0.01 to 0.5 moles of a primary or secondary hydroxy substituted amine containing 1 to 3 hydroxy groups,

to form an intermediate and in a second stage reacting said intermediate with:

(d) about 0.01 to 2.5 moles of a hydrocarbyl succinimide or succinamide, and

(e) about 0.005 to 0.5 moles of a polyoxyalkylene amine having the structure

$$H_2N-R-(O-R)_m-NH_2 \text{ or } R_1[(O-R)_n-NH_2]_p$$

wherein R is a divalent aliphatic hydrocarbon group containing 2 to 4 carbon atoms, R_1 is a polyvalent saturated hydrocarbon radical having the valence p and containing 2 to 10 carbon atoms, m is an integer from 1 to 50, n is an integer from 1 to 40, such that the sum of all n's is from 3 to 40 and p is an integer from 3 to 6,

wherein said hydrocarbyl succinimide or succinamide in (d) is the product made by reacting a hydrocarbyl succinic anhydride, acid, or ester with an amine containing 2 to 6 amino nitrogen atoms, at least one of which is primary, and about 1 to 30 carbon atoms, at least part of said hydrocarbyl succinimide or succinamide containing at least one reactive primary or secondary amine group.

11. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and a minor amount sufficient to provide dispersancy of an ashless dispersant of claim 1.

4,401,582
SOFT CONTACT LENS AMBIENT TEMPERATURE DISINFECTANT SOLUTION AND METHOD

Guy J. Sherman, Mandeville, La., assignor to Sherman Laboratories, Inc., Abita Springs, La.

Continuation-in-part of Ser. No. 228,562, Jan. 26, 1981, Pat. No. 4,367,157, which is a continuation-in-part of Ser. No. 37,645, May 10, 1979, Pat. No. 4,356,100. This application Dec. 16, 1981, Ser. No. 331,150
The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.
Int. Cl.³ C11D *3/48*
U.S. Cl. 252—90 **16 Claims**

1. A method of treating a contact lens to kill bacteria associated therewith comprising:

(a) placing the lens in contact with an aqueous composition, said composition consisting essentially of water and a disinfectant ascorbic acid compound present in an effective amount to kill bacteria; and

(b) maintaining the lens in contact with said aqueous composition for time sufficient to kill bacteria.

11. A composition for ambient temperature disinfection of contact lenses consisting essentially of:

(a) an ascorbic acid compound selected from the group consisting of: ascorbic acid; a salt of ascorbic acid having

disinfectant properties and compatible with the contact lenses; and mixtures thereof, said ascorbic acid compound present in an amount of between about 0.1% and 20.0% by weight of the total aqueous composition calculated on the basis of ascorbic acid;

(b) potentiating agent selected from the group consisting of trimethoprim, thimerosal and mixtures thereof and present in an amount of between about 0.0001% and 5.0% by weight of the total aqueous composition;

(c) monothioglycerol present in an effective amount for stabilizing said ascorbic acid or salt thereof; and

(d) the composition being formulated in an atmosphere having substantially no free oxygen and packaged in a sealed container containing substantially no free oxygen.

4,401,583

ENHANCING OR AUGMENTING THE AROMA OF DETERGENTS USING 4-METHYL-3-CYCLOHEXENE-1-CARBOXYLIC

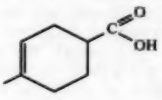
Nicholas Calderone, Syosset, N.Y.; Hugh Watkins, Lincroft, and Takao Yoshida, Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 299,211, Sep. 3, 1981. This application Jun. 24, 1982, Ser. No. 391,587

Int. Cl.³ C11D *3/50*

U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base, an aroma augmenting or enhancing quantity of 4-methyl-3-cyclohexene-1-carboxylic acid defined according to the structure:



4,401,584

SOLVENT BASED DEWATERING SYSTEM WITH DEMULSIFIER

Edward G. Tajkowski, Williamsville, N.Y., and Aaron Colbert, Livingston, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 17, 1982, Ser. No. 379,241

Int. Cl.³ C11D *3/4*; F26B *5/00*; B01D *43/00*

U.S. Cl. 252—194 **7 Claims**

1. A solvent-surfactant drying composition comprising:

(a) 1,1,2-trichloro-1,2,2-trifluoroethane, and containing

(b) from about 0.05 to about 1 weight percent of at least one N-acylated sarcosine of the formula

$$RCON(CH_3)CH_2COOH$$

wherein R is an alky or alkylene substituent of 10 to 20 carbon atoms.

4,401,585

BIS(P-ALKYLPHENYLETHYNYL)ANTHRACENE

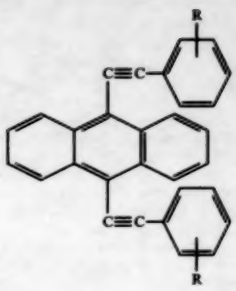
Frank J. Arthen, Jr., Hunterdon, and Robert J. Manfre, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 21, 1982, Ser. No. 341,390

Int. Cl.³ C09K *11/07*

U.S. Cl. 252—188.3 CL **7 Claims**

1. A composition defined by the formula



wherein R is selected from the group consisting of C_4 to C_{22} alkyl and C_4 to C_8 cycloalkyl.

4,401,586

PROCESS FOR THERMALLY EXPANDING SILICATE-BASED MATERIAL BY AN INFRARED HEAT SOURCE

Hugh A. Ghiringhelli, Wilton, Conn., assignor to TS Leasing Associates, New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,589

Int. Cl.³ C04B *21/00, 35/16*

U.S. Cl. 252—378 R **8 Claims**

1. In a process for producing expanded inorganic silicate particles comprising subjecting thermally expandable hydrated silicate-based composition particles to infrared radiation in a range extending below and including 3.5 microns to heat the particles so as to obtain expansion thereof at a low temperature with a particle temperature of approximately 100° C. and with essentially complete expansion of the particles when subjected to the infrared radiation being achieved in less than a minute.

4,401,587

AMINOMETHYLPHOSPHONIC ACID AND POLYMALEIC ANHYDRIDE COMBINATIONS FOR TREATING CORROSION

Bennett P. Boffardi, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1981, Ser. No. 331,448

Int. Cl.³ C23F *11/18, 11/14, 11/16*

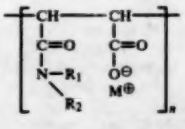
U.S. Cl. 252—389 A **7 Claims**

1. A method of inhibiting corrosion of low carbon steel in an aqueous system comprising the step of treating said system with from 1.0 to 300 parts per million by weight of the total aqueous content of said system, of a corrosion inhibiting composition comprising

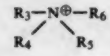
(1) one or more aminomethylphosphonic acid compounds; and

(2) one or more polymers selected from the group consisting of homopolymers, and random copolymers with acrylamide, of polymaleic anhydride and amine adducts of polymaleic anhydride selected from the group consisting of:

(a) polymers having recurring units of the formula:



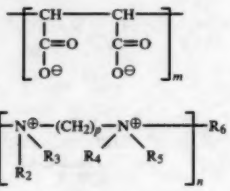
wherein $M^{\oplus}$ may be $H^{\oplus}$, alkali metal cation, or quaternary ammonium cation of the formula:



wherein for all of the above formulas, R_1, R_2, R_3, R_4, R_5, and R_6 are each independently selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, and substituted alkyl of from one to ten carbon atoms, where the substituent is hydroxyl; carbonyl; and carboxylic acid groups, and alkali metal ion and ammonium salts thereof; and

wherein n is an integer of from 2 to 100; and

(b) polymers having recurring units of the formula:



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are each independently selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, and substituted alkyl of from one to ten carbon atoms, where the substituent is hydroxyl; carbonyl; and carboxylic acid groups, and alkali metal ion and ammonium salts thereof;

wherein p is an integer of from 1 to 6;

wherein m is an integer of from 2 to 100; and

wherein n is an integer of from 2 to about 100, provided that, n not equal to m, the lesser of m or n is multiplied by a factor such that n=m;

wherein the polymaleic anhydride and amine adducts of polymaleic anhydride have a weight average molecular weight of from about 200 to about 10,000; and

wherein the weight ratio of aminomethylphosphonic acid to polymer is from 10:1 to 1:10.

4,401,588

MANUFACTURE OF ACTIVATED CARBON FABRIC

John J. P. Turner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1982, Ser. No. 401,309

Int. Cl.³ B01J 37/10; D01F 9/12, 9/14

U.S. Cl. 252—421 **5 Claims**

1. A process for making an activated carbon fabric in a single step consisting essentially of, heating an aramid fabric under a gaseous stream containing a mixture of inert gas and from about 0.5 to 20 volume percent steam at a temperature in the range of 850° to 950° C. for at least about 10 minutes and then cooling the fabric to room temperature in a protective atmosphere.

4,401,589

PROCESS FOR PRODUCING OLEFIN POLYMERS OR COPOLYMERS

Mamoru Kioka, Ohtake; Hiroaki Kitani, Waki, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 159,440, Jun. 13, 1980, Pat. No. 4,330,649. This application Nov. 17, 1981, Ser. No. 322,201

Claims priority, application Japan, Jun. 18, 1979, 54-75582

Int. Cl.³ C08F 4/64

U.S. Cl. 252—429 B **12 Claims**

1. A solid titanium catalyst component containing magnesium, titanium, halogen and an electron donor and derived from a magnesium compound in the liquid state, a halogen-containing titanium compound in the liquid state and the electron donor for producing a polymer or copolymer of an olefin or olefins with or without up to about 5 moles of a diolefin; characterized in that said solid titanium catalyst component is

(i) the product of reaction of (a) a magnesium compound in the liquid state having no reducing ability with (b) a halogen-containing titanium compound, in the liquid state in the presence of an electron donor having no active hydrogen, said magnesium compound (a) being a liquid magnesium compound or a solution of a magnesium compund in a hydrocarbon solvent or being obtained by contacting the magnesium compound with at least one electron donor selected from the group consisting of alcohols, organic carboxylic acids, aldehydes, amines and mixtures thereof, or

(ii) the product of reaction of the magnesium compound (a) with the halogen-containing titanium compound (b) in the absence of the electron donor having no active hydrogen atom followed by treatment with the electron donor having no active hydrogen atom, the halogen-containing titanium compound (b) being in such an amount that the solid titanium catalyst component is formed and precipitated and is at least 1 mole per mole of the magnesium compound (a), and the mole ratio of the compound (a) to the compound (b) in the catalyst component, calculated as metal atoms, is at least about 4.

4,401,590

CONDUCTIVE PYROLYTIC PRODUCT AND COMPOSITION USING SAME

Susumu Yoshimura, and Mutsuaki Murakami, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Mar. 25, 1981, Ser. No. 247,316

Claims priority, application Japan, Mar. 26, 1980, 55-39305; Apr. 14, 1980, 55-49376; Aug. 11, 1980, 55-110566; Aug. 11, 1980, 55-110567; Aug. 13, 1980, 55-112162

Int. Cl.³ C08G 73/06, 73/08, 73/14

U.S. Cl. 252—514 **7 Claims**

1. A conductive pyrolytic product obtained by thermally treating a polyamide-imide product of isophthaloyl chloride, meta-phenylene diamine and pyromellitic anhydride at a temperature ranging from 400° C. to 1000° C. in vacuo or in an inert atmosphere, the thermal treatment being maintained for a time sufficient to provide a pyrolytic product having a specific resistance of 10^{-1} ohm or below.

4,401,591

TREATMENT OF ORGANIC ION EXCHANGE MATERIAL CONTAINING RADIOACTIVE WASTE PRODUCTS

Milan Korostenski, Västeras, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Jan. 28, 1981, Ser. No. 229,117

Claims priority, application Sweden, Jan. 31, 1980, 8000757

Int. Cl.³ C01F 9/28

U.S. Cl. 252—629 **10 Claims**

1. A method for the treatment of an organic ion exchange material which contains radioactive waste products and comprises a mixture of grains of a first type bearing groups containing exchangeable hydrogen ions and grains of a second type bearing groups containing exchangeable hydroxyl ions, which method comprises the steps of

(a) removing said ions from at least one of said first and second types of grains in said mixture of grains,

(b) thereafter separating the grains of said first type from the grains of said second type, and

(c) further processing the grains of each of said first and second types separately for final storage of at least said radioactive waste products.

4,401,592

PHARMACEUTICAL COMPOSITION HAVING ANTITUMOR ACTIVITY

Chikao Yoshikumi, Kunitachi; Takayoshi Fujii, Tokyo; Masahiko Fujii, Tokyo; Kenichi Matsunaga, Tokyo; Yoshiharu Oguchi, Yono, and Koichi Niimura, Sayama, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Continuation-in-part of Ser. No. 103,474, Dec. 14, 1979, Pat. No. 4,315,851. This application Nov. 16, 1981, Ser. No. 321,486

Claims priority, application Japan, Dec. 29, 1978, 53-161388; Nov. 2, 1979, 54-142152; Nov. 2, 1979, 54-142153

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ A61K *39/44;* C07G *7/00*

U.S. Cl. 260—112 B 9 Claims

1. A pharmaceutical composition is dosage unit form for use in the treatment of cancer, which comprises a therapeutically effective amount of a substance bonded by amide bonding an anti-cancer drug having at least one amino group or carboxyl group, selected from the group consisting of antibiotic substances, antimetabolitic substances and alkylating agents with an anti-cancer antibody obtained by purifying immunogloubulin fraction with affinity-chromatography, in the presence of a reagent selected from the group consisting of thionyl chloride, diethyl phosphorocyanidate and a carbodiimide, and a pharmaceutically acceptable carrier.

4,401,593

GLYCINE - 8 CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,472

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 T 7 Claims

7. A Gly⁸-calcitonin selected from the group consisting of Gly⁸-salmon calcitonin and Gly⁸-eel calcitonin.

4,401,594

L-ARGININAL DERIVATIVES AND A METHOD OF MANUFACTURING THE SAME

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Takaaki Aoyagi, Fujisawa; Shinichi Ishii, Sapporo; Tetsushi Saino, Yono, and Tetsuya Someno, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

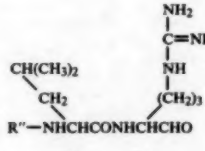
Filed Sep. 8, 1981, Ser. No. 300,443

Claims priority, application Japan, Sep. 19, 1980, 55-129097

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R 8 Claims

1. An L-argininal derivative of the general formula:



in which R'' is a group selected from the group consisting of n-nonanoyl, m-chlorbenzoyl, p-methylbenzoyl, p-methoxybenzoyl, p-nitrobenzoyl, benzenesulfonyl, 2-naphthalenecarbonyl, 1-naphthalenesulfonyl, mandelyl, p-nitrophenylacetyl, L-nicotinyl, N-benzyloxycarbonyl-L-phenylalanyl, N-benzyloxycarbonyl-3-amino-2-hydroxy-4-phenylbutanoyl, N-benzyloxycarbonyl-L-prolyl, L-prolyl, N-benzyloxycarbonyl-pyroglutamyl, L-pyroglutamyl, p-toluenesulfonyl, and pipecolyl.

4,401,595

4-ALLYL AZETIDINONE INTERMEDIATE FOR β-LACTAM ANTIBACTERIAL AGENTS

Andrew J. G. Baxter, Merstham; Patricia M. Roberts, Redhill, and Robert Southgate, Warnham, all of England, assignors to Beecham Group Limited, England

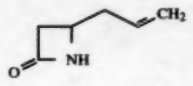
Division of Ser. No. 887,841, Mar. 21, 1978. This application Oct. 19, 1981, Ser. No. 312,658

Claims priority, application United Kingdom, Mar. 19, 1977, 11749/77

Int. Cl.³ C07D *205/08, 487/04*

U.S. Cl. 260—239 A 1 Claim

1. A compound of the formula (XIX):



(XIX)

4,401,596

NOVEL 17-OXAZOLINE-STEROIDS

Derek H. Barton; William B. Motherwell, and Samir Zard Zard, all of Gif-sur-Yvette, France, assignors to Roussel Uclaf, Paris, France

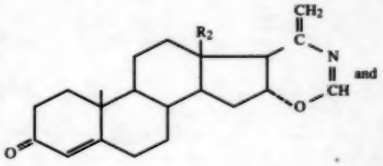
Filed Nov. 3, 1981, Ser. No. 317,584

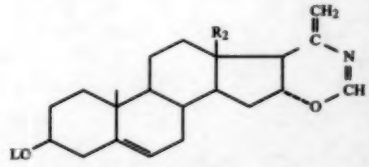
Claims priority, application France, Nov. 5, 1980, 80 23575

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239.55 4 Claims

1. A compound having a formula selected from the group consisting of





wherein R_2 is alkyl of 1 to 4 carbon atoms and L is selected from the group consisting of methoxymethyl, β-methoxyethoxymethyl, benzyl, p-nitrobenzyl, trimethylsilyl, tert.-butyldimethylsilyl, triethylsilyl, acetyl, propionyl and benzoyl.

4,401,597

IMIDAZODIAZEPINES AND PROCESSES THEREFOR

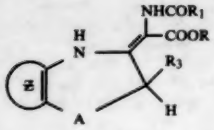
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 242,852

Int. Cl.³ C07D *487/04, 487/22;* A61K *31/55*

U.S. Cl. 260—244.4 1 Claim

1. A compound of the formula

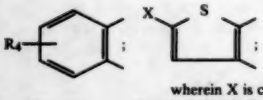


wherein R is lower alkyl; A is

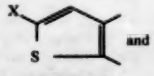
R_3 is selected from the group consisting of hydrogen and lower alkyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, dihalo or halo/-nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl; R_4 is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, mono- or di-C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino, amino, hydroxy lower alkyl and lower alkanoyl; R_1 is selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, C_1 to C_7 acyloxy lower alkyl, phenyl, C_1 to C_7 alkoxy lower alkyl, halo lower alkyl, amino lower alkyl, mono- or di-C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl, pyridyl, benzyl and the groups

wherein R is hydrogen or lower alkyl and COOR wherein R is lower alkyl; and

is selected from the group consisting of

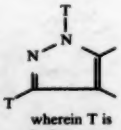


wherein X is chlorine, bromine, iodine or hydrogen



wherein X is chlorine, bromine, iodine or hydrogen

and



wherein T is hydrogen or lower alkyl

4,401,598

PRODUCTION OF ORGANOSILICON COMPOUNDS HAVING AZIDO GROUPS

Alfons Karl, Hanau, and Wolfgang Buder, Rodenbach, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

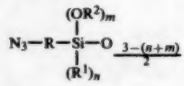
Filed Oct. 20, 1981, Ser. No. 312,979

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040328

Int. Cl.[3] **C07C** *117/00*

U.S. Cl. 260—349 **37 Claims**

1. A process of preparing an azido group containing organosilicon compound of the formula



I

where R is a divalent hydrocarbon group having 1 to 8 carbon atoms which is free from ethylenically unsaturated bonds or R is $(CH_2)_o X(CH_2)_p$ where o is 1 to 7, p is 1 to 7, and the total of o and p is 2 to 8 and X is O,S, or

where R^3 is hydrogen, methyl, ethyl, or phenyl,

R^1 is a univalent alkyl group having 1 to 3 carbon atoms, phenyl, benzyl, or tolyl,

R^2 is an alkyl group having 1 to 4 carbon atoms, phenyl, benzyl, or an alkoxyalkyl group having a total of up to four carbon atoms,

m is zero, 1, 2, or 3, and

n is zero, 1 or 2 whereby $m<3-n$, comprising reacting a halosilane of the formula

$$X—R—SiR_n^1(OR^2)_{3-n} \quad (II)$$

in which X is chlorine or bromine with an azide of the formula

$$MN_3 \quad (III)$$

in which M is lithium.

4,401,599

PREPARATION OF 21-HALO STEROIDS

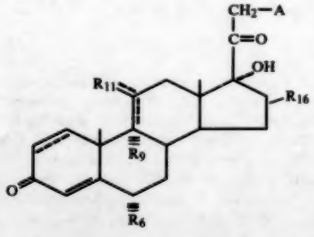
Jerry A. Walker, and Edward J. Hessler, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 264,593, May 18, 1981, Pat. No. 4,357,279. This application May 17, 1982, Ser. No. 378,941

Int. Cl.[3] **C07J** *5/00*

U.S. Cl. 260—397.45 **31 Claims**

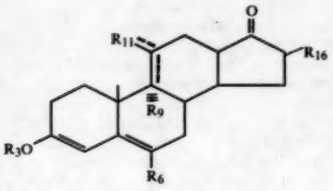
1. A process for the preparation of a 21-halo steroid of the formula



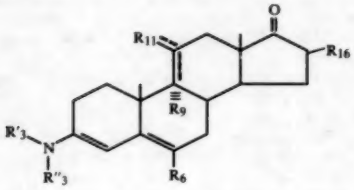
(X)

which comprises

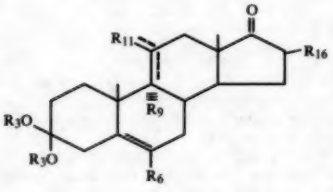
(1) contacting a protected 17-keto steroid selected from the group consisting of compounds of the formula



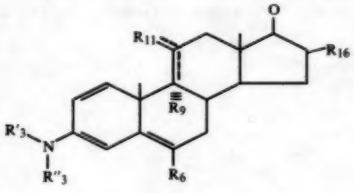
(IIa)



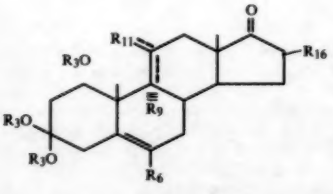
(IIb)



(IIc)

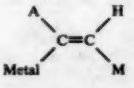


(IId)



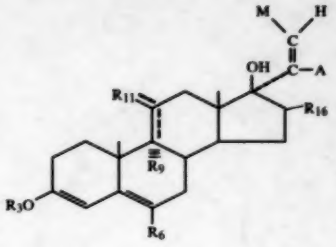
(IIe)

with a metallated 1,2-dihalogenated ethene of the formula

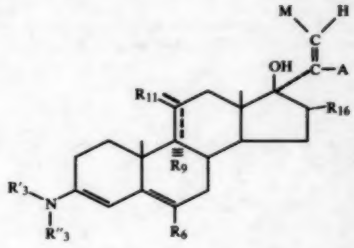


(III)

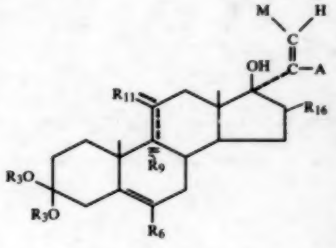
to form the corresponding protected C_{21}-steroid selected from the group consisting of compounds of the formula



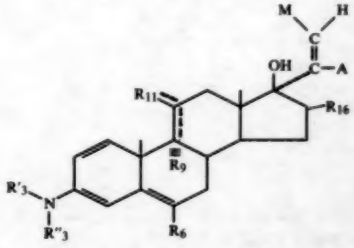
(IVa)



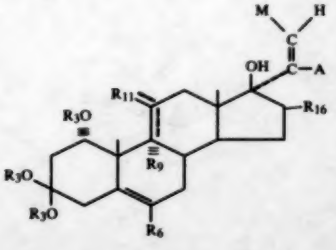
(IVb)



(IVc)



(IVd)

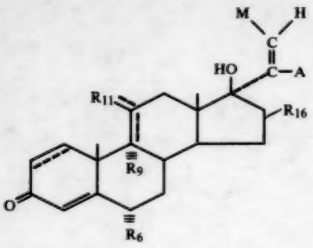


(IVe)

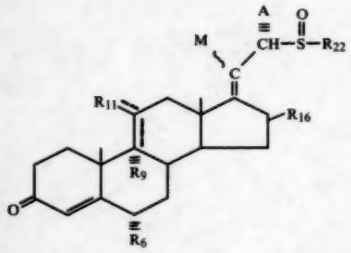
respectively;

(2) hydrolyzing the protected C_{21}-steroids (IVa–IVe) with

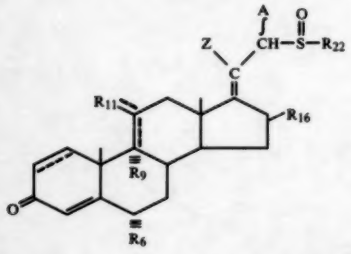
acid to remove the protecting group and give a C_{21}-steroid of the formula


(V)

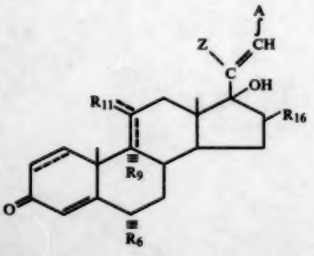
(3) contacting the C_{21}-steroid (V) with a sulfenylating agent of the formula R_{22}—S—X (VI) to give a 20,21-dihalo steroid of the formula


(VII)

(4) contacting the 20,21-dihalo steroid (VII) with an alkoxide, or mercaptide of the formula $OR_{20}^{\ominus}$ or $SR_{20}^{\ominus}$, respectively, to give a sulfoxide of the formula


(VIII)

(5) contacting the sulfoxide (VIII) with a thiophile to give a 20-unsaturated steroid of the formula


(IX)

and

(6) hydrolyzing the 20,21-unsaturated steroid (IX) with acid

where

A is a fluorine, chlorine or bromine atom,

M is a fluorine, chlorine or bromine atom,

R_3 is alkyl of 1 thru 5 carbon atoms with the proviso that with the ketal (IIIc and IIIe), the R_3 groups can be connected to form the ethylene ketal,

R_3' is alkyl of 1 thru 5 carbon atoms,

R_3'' is alkyl of 1 thru 5 carbon atoms,

R_6 is a hydrogen or fluorine atom or methyl group,

R_9 is a hydrogen or fluorine atom, hydroxyl group, -OSi(R)$_3$ or nothing,

R_{11} is (H), (H,H), (H, β-OH), (H, β-OSi(R)$_3$), or O,

R_{16} is a hydrogen atom or methyl group,

R_{20} is alkyl of 1 thru 4 carbon atoms or phenyl,

R_{22} is alkyl of 1 thru 5 carbon atoms, trichloromethyl, phenyl, phenyl substituted with 1–4 carbon atoms or substituted with 1 thru 3 nitro or trifluoromethyl groups, aralkyl of 7 thru 12 carbon atoms or —N—(R_{122})$_2$ or phthalamide,

X is a chlorine or bromine atom, phenylsulfone, phthalimide or imidazole group,

Z is —OR_{20} or —SR_{20},

metal is lithium, sodium or potassium,

~ indicates the attached group can be in either the α or β configuration, and

. . . is a single or double bond.

4,401,600

CERTAIN 3-PHENYLHYDRAZONO-2-AMINO-1,1,3-PROPENE TRICARBONITRILE

Robert Portmann, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

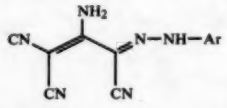
Division of Ser. No. 122,785, Feb. 19, 1980, abandoned, which is a division of Ser. No. 42,696, May 25, 1979, Pat. No. 4,243,583. This application Aug. 18, 1981, Ser. No. 294,253

Claims priority, application Switzerland, Jun. 2, 1978, 6077/78

Int. Cl.[3] **C07D** *109/16*

U.S. Cl. 260—465 E **3 Claims**

1. A compound of the formula



in which Ar is a substituted or unsubstituted phenyl radical or a naphthyl radical wherein the substituents are one or more halogen atoms or nitro, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, m- or p-carboxyl, aryloxy, C_1–C_4-alkoxycarbonyl, sulfonamide, carboxamide, acyl, acylamino or phenylazo groups, and the phenyl nucleus in the phenylazo groups can be substituted by chlorine, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl or sulfonamide groups.

4,401,601

NOVEL PROCESS FOR THE PREPARATION OF TETRA-SUBSTITUTED CYCLOPROPANE COMPOUNDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

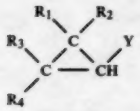
Filed Mar. 23, 1981, Ser. No. 246,172

Claims priority, application France, Mar. 28, 1980, 80 06979

Int. Cl.[3] **C07C** *121/46, 69/74, 61/04*

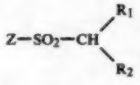
U.S. Cl. 260—464 **6 Claims**

1. A process for the preparation of tetrasubstituted cyclopropane compounds of the formula



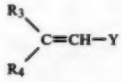
I

wherein Y is selected from the group consisting of —CN and —COOR, R is alkyl of 1 to 6 carbon atoms and R_1, R_2, R_3 and R_4 are individually selected from alkyl of 1 to 4 carbon atoms or R_1 and R_2 or R_3 and R_4 together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 6 carbon atoms with the 2 substituents not forming the ring being alkyl of 1 to 4 carbon atoms or R_1 and R_2 on the one hand and R_3 and R_4 on the other together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 6 carbon atoms comprising reacting a sulfone of the formula



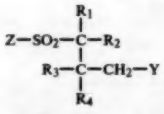
III

wherein Z is a monocyclic hydrocarbon aromatic group and R_1 and R_2 have the above definition at a temperature of −90° to 0° C. with a strong base selected from the group consisting of alkali metal alcoholates, alkali metal amides, alkali metal hydrides, aryllithiums and alkyllithiums in a polar solvent and reacting the resulting product at a temperature of −90° to 0° C. with a compound of the formula



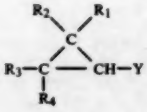
II

wherein Y, R_3 and R_4 have the above definition to obtain a compound of the formula



IV

and reacting the latter in the presence of a strong base selected from the group consisting of alkali metal alcoholates, alkali metal amides, alkali metal hydrides, aryllithiums and alkyllithiums in a polar solvent at a temperature of −90° to 0° C. and then allowing the mixture to rise to about room temperature to obtain a compound of the formula



I

4,401,602

4-TRIFLUOROMETHYLPHENOXY-BENZALDOXIMES

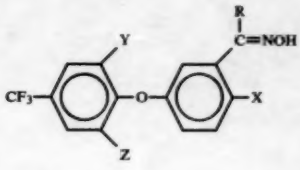
Dennis K. Kraus, Canal Fulton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 136,171, Apr. 15, 1980, Pat. No. 4,344,789, which is a continuation-in-part of Ser. No. 38,043, May 11, 1979, abandoned. This application Apr. 30, 1982, Ser. No. 373,780

Int. Cl.³ C07C *121/80, 131/00*

U.S. Cl. 260—465 E 1 Claim

1. A compound of Formula III:



(III)

wherein:

X is nitro (—NO_2), a halogen, or cyano (—CN);

Y is hydrogen or chlorine;

Z is chlorine when Y is chlorine or Z is hydrogen when Y is chlorine or hydrogen; and

R is hydrogen or an alkyl of up to three carbon atoms.

4,401,603

PROCESS FOR THE PREPARATION OF ARYL ISOCYANIDE-DICHLORIDES

Dieter Ferchland, Kelkheim; Ulrich Kussmaul, Niederdorfelden; Manfred Langer, Frankfurt am Main, and Rolf. Müller, Karben, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,253

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134134

Int. Cl.³ C07C *119/00*

U.S. Cl. 260—543.2 11 Claims

1. In the process for preparation of aryl isocyanide-dichloride having 6 to 12 aryl carbon atoms by chlorinating N-arylformamide having 6 to 12 aryl carbon atoms in the presence of thionyl chloride, the improvement comprises preparing the N-arylformamide by formylation of an arylamine having 6 to 12 aryl carbon atoms with a formylating agent in an inert solvent,

removing excess formylating agent and by-products of the formylation thereby leaving the N-arylformamide in the form of a solution or suspension in the inert solvent and chlorinating the N-arylformamide in solution or suspension with a chlorinating agent in the presence of thionyl chloride.

4,401,604

PROCESS FOR PREPARING THIOSULFENAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINE TRIESTERS

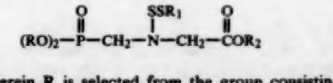
James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1981, Ser. No. 309,328

Int. Cl.³ C07F *9/32*

U.S. Cl. 260—968 37 Claims

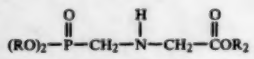
1. A process for preparing a compound of the formula



(I)

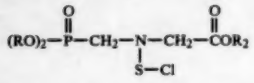
wherein R is selected from the group consisting of phenyl, naphthyl, biphenylyl; or phenyl, naphthyl or biphenylyl substi-

tuted with from 1 to 3 substituents, independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and R_1 is independently alkyl, cycloalkyl, aralower alkyl, phenyl, naphthyl or phenyl or naphthyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl and nitro, and R_2 is lower alkyl or aralower alkyl which comprises reacting a compound of the formula



(II)

wherein R and R_2 are as aforedefined with SCl_2 aprotic solvent and in the presence of a hydrogen chloride acceptor to form a compound of the formula



(III)

wherein R and R_2 are as above defined, and reacting said compound of formula (III) with a compound of the formula

R_1SH (IV)

to form said compound of formula (I) and in the presence of a hydrogen chloride acceptor.

4,401,605

PROCESS FOR SCAVENGING SULFUR MONOCHLORIDE FROM THE REACTION MIXTURE FROM THE CHLORINATION OF DIALKYLDITHIOPHOSPHORIC ACID TO DIALKYLTHIOPHOSPHORIC ACID CHLORIDE

Steven E. Earnest, Gladstone, Mo., assignor to Mobay Chemical Corporation, Kansas City, Mo.

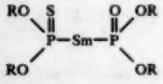
Filed May 13, 1982, Ser. No. 377,880

Int. Cl.³ C07F 9/20

U.S. Cl. 260—990 **3 Claims**

1. In the production of an O,O-dialkylphosphorothioic acid chloride of the formula

in which R is alkyl, wherein a chlorinating agent is reacted with a bis(thiophosphono) sulfide of the formula



in which m is a whole number, or with a dithiophosphoro compound of the formula

in which M is hydrogen or an alkali metal to produce a mixture comprising the desired acid chloride, some unreacted starting material and by-products including sulfur monochloride; and the desired acid chloride is separated from the balance of the mixture, the improvement which comprises contacting the mixture before separation with phosphorus trichloride, thereby to convert some of the unreacted starting material to additional desired acid chloride and to convert some of the sulfur monochloride to thiophosphoryl chloride, and distilling off the thiophosphoryl chloride, thereby avoiding precipitation of solid sulfur as occurs upon standing of sulfur monochloride.

4,401,606

APPARATUS AND METHOD FOR REFORMING HIGH-MOLECULAR WEIGHT OILS

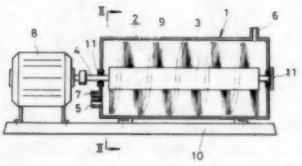
Mitsutoshi Matsuoka, Tottori, Japan, assignor to Takeshi Arakawa, Fukuoka, Japan, a part interest

Filed Sep. 8, 1981, Ser. No. 299,954

Claims priority, application Japan, Sep. 11, 1980, 55-127637; Oct. 30, 1980, 55-153516

Int. Cl.³ B01F 3/04

U.S. Cl. 261—93 **4 Claims**



1. A method for reforming high molecular weight fuel oils, comprising the steps of

introducing a high molecular weight fuel oil selected from the group consisting of heavy oil, waste oil, animal oil and vegetable oil, and water in a proportion of 10 to 30 vol. % based on the fuel oil into a casing, and

dispersing the water in the fuel oil in the form of ultrafine particles by rotating a rotor having a number of hard wire projections at a speed of 1600 to 3600 r.p.m. in the casing.

4,401,607

AERATED DRINKS MACHINE

Robert P. Child, Cosham, and Barry G. Charles, Rowlands Castle, both of England, assignors to Thorn Cascade Company Limited, London, England

Filed Mar. 30, 1981, Ser. No. 248,707

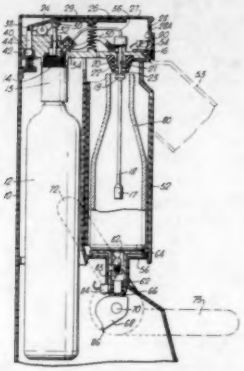
Claims priority, application United Kingdom, Apr. 2, 1980, 8011043

Int. Cl.³ B01F 3/04

U.S. Cl. 261—121 R **8 Claims**

1. An appliance for making an aerated beverage, said appliance comprising a casing, a connection carried by said casing for mounting a container of pressurized liquid carbon dioxide, a transparent shatterproof housing for a bottle of water carried by said casing, and pivotally mounted so that it can be pivoted from a first position in which a bottle can be introduced into or removed from said shatterproof housing and a second position, a nozzle communicating with said connection and extending downwardly within said housing, a stopper engaging in the neck of a bottle, a table for temporarily supporting the bottle within said housing when the latter is in its second position, so that the stopper is engaged therein, a manually operable valve allowing carbon dioxide to flow from a container mounted on said connection to said nozzle, so that it is injected into water in a bottle temporarily supported by the table, a safe'y pressure valve connected to the interior of a bottle when the stopper is engaged in its neck and an incandescant bulb provided in the

table for temporarily supporting the bottle within said housing, whereby the bulb is within the housing and adjacent the bottle,



effective to illuminate the bottle at least while the water therein is being aerated.

4,401,608

METHOD FOR ENLARGING GRAIN SIZE OF URANIUM OXIDE

Peter C. Smith, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 13, 1981, Ser. No. 310,619
Int. Cl.³ G21C *21/00*
U.S. Cl. 264—0.5 **8 Claims**

1. A method of enlarging the grain size of sintered uranium oxide in the manufacture of fissionable nuclear fuel, comprising the steps of:

(a) adding a solution of hydrogen peroxide in amounts of up to about 5 weight percent to solid powdered uranium oxide and mixing the hydrogen peroxide solution through the solid powdered uranium oxide;

(b) pressing the powdered uranium oxide with the hydrogen peroxide solution mixed therethrough into green coherent bodies; and

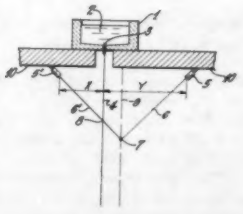
(c) sintering the green coherent bodies of powdered uranium oxide to affect the grain growth.

4,401,609

METAL ATOMIZATION

Dennis L. McGarry, Granville, and Frederick K. Roehrig, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 19, 1981, Ser. No. 322,802
Int. Cl.³ B01J *2/06*
U.S. Cl. 264—11 **5 Claims**



1. A method of producing fine platinum metallic particles comprising discharging a molten metal stream into contact with one of two intersecting high pressure jets of water at an offset ratio of less than 0.50, said offset ratio being defined as

$$X/(X+Y)$$

in which

X is the horizontal distance between the discharging metal stream and the locus of discharge of the nearest water stream, and

(X+Y) is the horizontal distance between the locii of discharge of said water streams to produce metallic particles as small as 400 mesh, the molten stream being discharged into contact with said jets through an aperture having a diameter of between about 30 and about 45 mils, said water being discharged as flat fan jets angled downwardly at about 60° from the horizontal.

4,401,610

METHOD FOR MANUFACTURE OF SHAPED OBJECTS OF MINERAL WOOL

Ingemar Öhberg, Skövde, Sweden, assignor to Rockwool Aktiebolaget, Skövde, Sweden

Continuation of Ser. No. 958,687, Nov. 7, 1978, abandoned. This application Sep. 29, 1980, Ser. No. 191,444
Claims priority, application Sweden, Nov. 9, 1977, 7712654
Int. Cl.³ B01J *2/22*
U.S. Cl. 264—40.4 **14 Claims**

1. A method of making moulded objects of mineral wool of a desired, substantially constant cross-section along their lengths, comprising the steps of:

delivering pieces of mineral wool including a non-hardened binder to a feeding chamber and therefrom into a mould channel extending therefrom,

and, using a mechanical compression means, moving said mineral wool pieces into and through said mould channel and concurrently hardening the binder, such that the mineral wool is concurrently compressed into said desired shape cross-section and hardened as the mineral wool moves through the mould channel.

4,401,611

EMBOSSING OF FOAMABLE PLASTISOLS ON DRY BLEND LAYERS

Robert D. Mansolillo, Bloomfield, and Stanley J. Kaminski, Trenton, both of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Filed Nov. 12, 1981, Ser. No. 320,290
Int. Cl.³ B29C *23/00*; B29H *7/20*
U.S. Cl. 264—46.4 **4 Claims**

1. Method of producing a composite sheet, the steps consisting essentially of:

(a) Laying down on a substrate, a dry blend composition consisting essentially of particles of thermoplastic organic resin randomly intermixed with particles of a chemical foaming inhibitor;

(b) Sintering said particles to form a stable layer comprised of adhering particles of resin and particles of said foaming inhibitor;

(c) Applying an organic foamable plastisol composition, containing thermoplastic resin and plasticizer therefor and a chemical blowing agent, upon said nonfoamed layer of thermoplastic resin and foaming inhibitor; which blowing agent is inhibited or accelerated in its decomposition by contact with said foaming inhibitor;

(d) Heating to a temperature level at which a portion of said

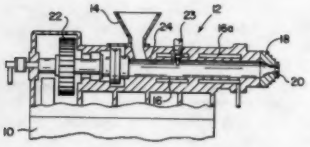
blowing agent in the foamable plastisol composition decomposes, in response to the effect of time and temperature thereon as influenced by contact occurring between blowing agent and the foaming inhibitor in the nonfoamed layer; and moreover the resinous components are fused into a unitary, nonporous film or sheet, and the plastisol applied thereto is converted —by solvation and ultimate fusion of the resinous component thereof, and by decomposition of the blowing agent—into a foamable thermoplastic, foamed in randomly distributed, irregularly shaped lump-like elevated areas interspersed with irregularly shaped trough-like depressions.

4,401,612

METHOD AND APPARATUS FOR EXTRUDING FOAM POLYMERIC MATERIALS INVOLVING THE USE OF AN EXTRUSION SCREW HAVING SPACED MULTIPLE FLIGHT MIXING MEANS THEREON

Sam D. Nehmey, Lorain, and James W. Summers, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 17, 1981, Ser. No. 274,619
Int. Cl.³ B29D *27/00*; B29F *3/02*
U.S. Cl. 264—53 **10 Claims**



1. Method for extruding a cellular polymeric material with an extruder having disposed therein an elongated screw comprising charging a particulate polymeric material into the feed section of the extruder, advancing said material through the melt section of the extruder where said material is progressively converted from a solid to a molten state, injecting a blowing agent into said molten material at the injection section of the extruder to form a mixture of said material and the blowing agent, advancing said mixture through a mixing section of the extruder, agitating said mixture in said mixing section by means of rotating multiple screw flights on the screw, further agitating said mixture in at least one open slot provided on the screw in the mixing section, advancing said mixture from the open slot by means of the multiple flights while agitating same, and extruding said mixture whereby the blowing agent expands to form a cellular product.

4,401,613

METHOD OF MAKING THERMAL-INSULATING MODULE

R. Bruce Abell, Algonquin, and Richard K. Woodruff, West Dundee, both of Ill., assignors to Refractory Products Co., West Dundee, Ill.

Filed Aug. 3, 1981, Ser. No. 289,812
Int. Cl.³ F27D *1/16*; B29D *3/02*
U.S. Cl. 264—108 **8 Claims**

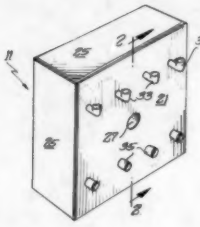
1. A method of making a thermal-insulating module for use in an electric furnace, which method comprises

providing a mold having four generally vertical walls for forming the hot face, the cold face and a pair of side faces of a furnace insulation module, said wall for forming said hot face having aligned cavity means for holding end portions of a plurality of ceramic supports,

inserting said end portions of said individual ceramic supports in said cavity means so that a body portion of each of said supports extends into a central portion of said mold,

supplying said mold with an aqueous slurry of refractory fibers plus an inorganic binder and withdrawing water to form a mat of discrete fibers having a hot face, a cold face and a plurality of side faces, in which mat said body portions of said ceramic supports are embedded,

opening said mold by moving either said hot-face-defining wall or said cold-face-defining wall relative thereto,



removing said wet fibrous mat, and

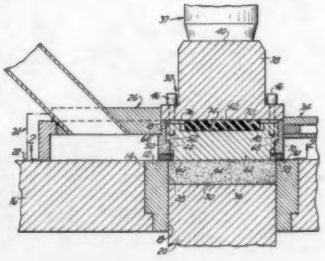
drying said mat to form a module wherein said embedded body portions of said supports are firmly anchored by said fibers of said mat which are interconnected and bonded together by said inorganic bonding agent and wherein said end portions of said ceramic supports protrude from said hot face to provide support for an electrical resistance heating element in a furnace enclosure.

4,401,614

ANVIL ASSEMBLY FOR A POWDER-COMPACTING ANVIL PRESS

Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed Sep. 8, 1981, Ser. No. 300,577
Int. Cl.³ B30B *11/02*
U.S. Cl. 264—109 **15 Claims**



1. In an apparatus for compacting power material into a compacted article, said apparatus comprising a stationary die plate, a bore in said die plate, a punch reciprocably movable in said bore and having an end face forming with a portion of said bore a die cavity controllably fillable with powder material, and an anvil assembly having a face positionable over said die cavity for compacting said article between said punch and said anvil surface, the improvement comprising the face of said anvil assembly having a stationary face portion and a movable face portion formed on the end of a pad movable relative to said stationary face portion from a position wherein said movable face portion is flush with the surface of said die plate to a position wherein said movable face portion is away from said surface, abutment means limiting the motion of said pad, and

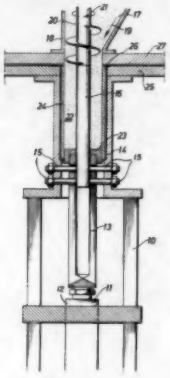
biasing means disposed behind said pad for urging said pad towards said die plate surface.

4,401,615

METHOD OF MOLDING A PERFORATED ARTICLE

Gunnar D. Gerhardson, Skogsbacken, Sweden, assignor to AB Jonkoping-Vulcan, Sweden

Continuation of Ser. No. 18,141, Mar. 7, 1979, abandoned. This application May 29, 1981, Ser. No. 268,343
Claims priority, application Sweden, Mar. 14, 1978, 7802873
Int. Cl.³ B29J *5/00*
U.S. Cl. 264—119 **5 Claims**



1. A method of molding a perforated, coherent article from a formable material, including flakes of cellulose which have been impregnated with a binder, comprising:

a. supplying said formable material to an elongated preforming chamber formed between inner and outer sidewalls, said performing chamber having a predetermined volume and cross-sectional shape;

b. compressing said formable material in said preforming chamber so that said formable material substantially assumes said cross-sectional shape of said preforming chamber;

c. transferring said formable material from said preforming chamber to a molding chamber, which has a shape substantially identical to the shape of said article and a volume less than said volume of said preforming chamber, at least a portion of said molding chamber having a cross-sectional shape substantially identical to said cross-sectional shape of said preforming chamber;

d. compressing said formable material as it is being transferred from said preforming chamber to said molding chamber while maintaining the general cross-sectional shape assumed by said formable material when in said preforming chamber, whereby said formable material substantially assumes the shape of said article; and

e. heating said formable material in said molding chamber to an extent sufficient to cure said formable material and complete the formation of said article.

4,401,616

METHOD FOR MAKING CUSTOM DENTAL IMPRESSION TRAYS

John W. Wagner, 8001 Lakemont Dr. NE., Seattle, Wash. 98115

Filed Aug. 19, 1981, Ser. No. 294,084
Int. Cl.³ B29C *17/02, 17/10*
U.S. Cl. 264—138 **1 Claim**

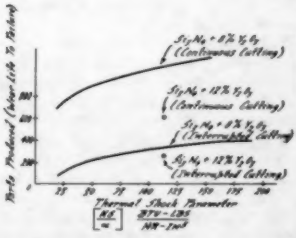
1. The method for making, on a study model of the patient's jaw ridge portion, a custom dental impression tray used for taking a precise final impression of at least that portion of a jaw ridge of a patient to receive a dental prosthesis, which method comprises precutting a flat sheet of thermoplastic material to form a flat sheet blank of a thickness 1/16 inch (1.6 mm) to 3/16 inch (4.8 mm) having a generally arcuate outer periphery and being of a width great enough to overhang the opposite outer lateral margins of the jaw ridge portion of the study model, building up the study model of the jaw ridge portion by packing successive overlying layers of thin tissue paper spacing material onto the model and thereby forming a composite layer having a total thickness of about 1 mm, to 3 mm, approximately equal to the desired thickness of final impression material to be used in the tray in taking the jaw ridge final impression, heating the flat sheet blank of thermoplastic material hard and tough at ambient temperatures until it reaches a deformable, nonresilient, nonliquid condition, manually shaping the heated flat sheet blank into a tray by deforming it onto the built-up study model so as to form a through closely complemental to the shape of at least a portion of the jaw ridge portion of the built-up study model but spaced from the model by the composite packing layer built up on it, and cooling the shaped tray sufficiently that the thermoplastic material returns to its hard and tough condition to preserve its shaped form for use as a custom dental impression tray.

4,401,617

CERAMIC CUTTING TOOL FORMED FROM SI_3N_4-Y_2O_3-SIO_2 AND METHOD OF MAKING

Andre Ezis, Grosse Ile; Shyam K. Samanta, Ypsilanti, and Krishnamoorthy Subramanian, Inkster, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 911,256, May 31, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,754
Claims priority, application Japan, Apr. 5, 1979, 54-40425; Canada, Apr. 25, 1979, 326356; Australia, May 30, 1979, 45597
Int. Cl.³ C04B *35/58*
U.S. Cl. 264—332 **5 Claims**



1. A method of making a unitary silicon nitride cutting tool comprising object, comprising:

(a) placing in a hot pressing environment a controlled mixture consisting essentially of Si_3N_4, Y_2O_3, Al_2O_3, and SiO_2, wherein said Al_2O_3 is present in an amount of 0.5–2.5% by weight of the mixture and Y_2O_3 comprises about 7% to about 9% by weight of said mixture and the Y_2O_3/SiO_2 weight ratio therein is at least about 1.6, said

controlled mixture being further comprised of a first part, a second part, and a third part said first part consisting essentially of substantially alpha phase Si_3N_4 and SiO_2 containing less than about 1.0% by weight cation impurities excluding free silicon, said second part consisting essentially of Y_2O_3, said third part consisting essentially of Al_2O_3;

(b) hot pressing said controlled mixture at a temperature and pressure and for a time sufficient to compact and react said controlled mixture into a unitary silicon nitride comprising object having a density of at least about 3.25 g/cm^3; and

(c) cooling the resultant unitary object.

4,401,618

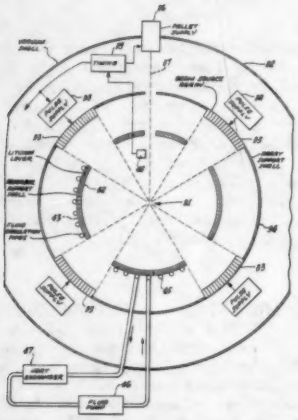
PARTICLE-INDUCED THERMONUCLEAR FUSION

Winfield W. Salisbury, Scottsdale, Ariz., assignor to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 712,487, Aug. 9, 1976, abandoned. This application Mar. 27, 1979, Ser. No. 24,314

Int. Cl.^{3} G21B *1/00*

U.S. Cl. 376—106 **31 Claims**



1. In a process for compressing and heating pellets of nuclearly fusible material with a focused electrically neutral charged particle beam, the steps of:

positioning a pellet of nuclearly fusible material in a reaction space within a reaction chamber substantially free of gas and electromagnetic fields;

periodically producing at locations remote from and spaced around the reaction space, a plurality of groups of charged particle beams, each of the groups of beams comprising a plurality of combined beams,

each of the combined beams comprising a stream of positive particles and a stream of negative particles produced from sources adjacent each other and traveling from the remote locations to the reaction space at substantially the same velocity and velocity profile and physically mixed to provide an overall electrically substantially neutral combined beam without neutralizing the positive and negative particles and wherein substantially all of said physical mixing takes place at a location immediately adjacent said sources; and

each of focusing the combined beams from the remote locations to the pellet in the reaction space by ballistically focusing each stream of each combined beam prior to forming said combined beam with said ballistically focusing being the sole focusing of the combined beam, substantially all of said positive and negative particles in the electrically neutral combined beams remaining as charged particles throughout their travel,

with the plurality of combined beams impinging on, compressing and heating the pellet by imparting energy and imploding momentum thereto.

4,401,619

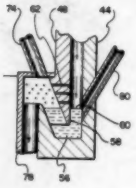
NUCLEAR REACTOR SEALING SYSTEM

James A. McEdwards, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1980, Ser. No. 219,560

Int. Cl.^{3} G21C *13/06*

U.S. Cl. 376—206 **7 Claims**



1. A liquid metal-cooled nuclear reactor system, including a vessel containing a cover gas, a body of liquid metal coolant located in a lower portion of the vessel, fuel assemblies positioned in the body of liquid metal coolant, at least one primary coolant flow system for circulating the liquid metal coolant in heat transfer relationship with the fuel assemblies, and a closure head disposed on an upper portion of the vessel in fluid-tight relationship therewith, said closure head comprising:

a first and second component defining an annulus therebetween;

insulation means disposed adjacent a bottom surface of said components and above the liquid metal coolant for maintaining an upper surface of said components at substantially ambient temperatures;

at least first and second inflatable seal means disposed in an upper portion of said annulus for sealing said annulus when they are inflated during normal reactor operation and permitting rotation of one of said components when they are partially deflated;

a liquid metal dip seal disposed in said annulus and extending into said insulation means, said dip seal including a trough on one of said components and a seal blade pendently supported from said other component and extended downwardly into the trough, a body of liquid metal in the trough which submerges a portion of the seal blade, the seal blade having at least one aperture located above the liquid metal for providing continuous fluid communication from one side of the blade to the other;

means for providing fluid communication between the area above the trough on one side of the seal blade and the cover gas;

means for introducing a purge gas intermediate the inflatable seals and the other side of the seal blade for passage through said at least one aperture, said means providing for the introduction of a sufficient amount of purge gas to substantially prevent migration of radioactive cover gas or sodium vapor up to the inflatable seals; and

means for withdrawing purge gas and cover gas from the vessel for purification and return to the vessel.

4,401,620

METHOD AND CIRCUIT ARRANGEMENT FOR DETERMINING THE INDIVIDUAL COOLANT FLOW RATE OF THE FUEL ELEMENTS OF A NUCLEAR REACTOR

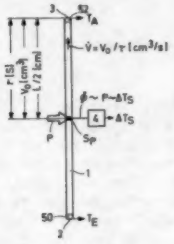
Martin Edelmann, Ettlingen, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,066

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008198

Int. Cl.³ G21C 17/00

U.S. Cl. 376—247 13 Claims



1. A method for determining the transit time τ of coolant traversing a cooling channel of a nuclear reactor fuel element from the effective center of said fuel element to a point where said coolant exits therefrom, comprising the steps of:

continuously measuring the temperature T_A of the coolant exiting said fuel element, said coolant outlet temperature being changed by fluctuations in reactor power, changes in the neutron flux and changes in the temperature of the coolant entering said fuel element;

continuously measuring the temperature T_E of said coolant before said coolant enters said fuel element;

generating a measured temperature rise signal ΔT_A corresponding to the difference between said measured coolant outlet temperature and said coolant inlet temperature;

continuously measuring the neutron flux Φ of the core of said nuclear reactor by means of at least one neutron detector to generate a neutron flux signal;

converting said neutron flux signal to a simulation signal simulating a change (rise) ΔT_S in an undelayed simulated coolant outlet temperature T_S due to heating of said coolant when traversing said fuel element;

comparing said measured temperature rise signal ΔT_A with the rise ΔT_S in said undelayed simulated coolant outlet temperature T_S; and

determining the time shift of said measured coolant outlet temperature T_A with respect to the undelayed simulated coolant outlet temperature T_S, said time shift corresponding to said transit time τ.

4,401,621

MAGNESIUM ALLOYS

William Unsworth, Wigan; John F. King, Greenmount, and Stephen L. Bradshaw, Ladybridge, all of England, assignors to Magnesium Elektron Limited, Great Britain

Filed Mar. 25, 1982, Ser. No. 361,645

Claims priority, application United Kingdom, Mar. 25, 1981, 8109364

Int. Cl.³ C22C 23/06

U.S. Cl. 420—403 17 Claims

1. A magnesium alloy consisting of, apart from normal impurities,

(a) from 1.5 to 10% by weight of an yttrium component consisting of at least 60% by weight of yttrium and the balance, if any, of heavy rare earth metals, and

(b) from 1 to 6% by weight of a neodymium component consisting of at least 60% by weight of neodymium, not more than 25% by weight of lanthanum and substantially all the balance, if any, of praseodymium,

the remainder of the alloy consisting of magnesium.

4,401,622

NICKEL-CHROMIUM-IRON ALLOY

Raymond C. Benn, Suffern, N.Y.; John R. Mihalisin, North Caldwell, N.J.; Leroy R. Curwick, Warwick, and Howard F. Merrick, Suffern, both of N.Y., assignors to The International Nickel Co., Inc., New York, N.Y. and Howmet Corporation, Dover, N.J.

Filed Apr. 20, 1981, Ser. No. 255,357

Int. Cl.³ C22C 19/05

U.S. Cl. 420—449 6 Claims

1. A high temperature, creep resistant alloy adapted for turbocharger applications and characterized by a stress-rupture life of 50 hours or more and an elongation of 5% or greater when tested at 1400° F. and 60,000 psi, said alloy consisting essentially of from about 3 to 4.25% titanium, about 2.25 to 3.5% aluminum, the sum of the titanium plus aluminum being about 6.25 to 7% with the ratio therebetween being about 1.1 to 1.4, about 10 to 12.5% chromium, about 4 to 6% molybdenum, about 22 to 26% iron, about 0.08 to 0.12% boron, about 0.12 to 0.16% carbon and the balance essentially nickel.

4,401,623

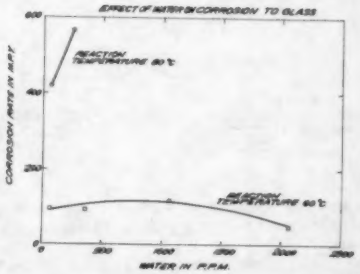
USE OF CALCIUM CHLORIDE TO MINIMIZE HYDROFLUORIC ACID CORROSION TO GLASS DURING THE CHLORINATION OF 4-CHLOROBENZOTRIFLUORIDE

Thomas J. Giacobbe, Skillman, and Grace Tsien, Colonia, both of N.J., assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jul. 17, 1981, Ser. No. 284,303

Int. Cl.³ C23F 11/18

U.S. Cl. 422—1 7 Claims


EFFECT OF WATER ON CORROSION TO GLASS
REACTION TEMPERATURE 80°C
REACTION TEMPERATURE 60°C
CORROSION RATE IN MPY
WATER IN P.P.M.

1. A method for preventing corrosion in a glass-liquid vessel due to the presence of HF liberated from an organic liquid medium within said vessel, said method comprising adding to said medium a corrosion preventing amount of particles of $CaCl_2$.

4,401,624

BUFFERED SOLUTIONS WHICH HAVE A REDUCED CORROSIVE NATURE

Charles B. Atwater, 3401 Hillview Ave., P.O. Box 10850, Palo Alto, Calif. 94303

Filed Mar. 8, 1982, Ser. No. 355,493

Int. Cl.³ A21D 2/14; A23B 4/12; C23F 11/12

U.S. Cl. 422—12 5 Claims

1. A method for reducing the corrosion of metals in contact

with an aqueous solution of a carboxylic acid which comprises maintaining said metal in contact with an aqueous solution of:

(a) about one equivalent of a metal salt of a carboxylic acid having the formula $R'C(O)O^-+M$;

(b) about one equivalent of a carboxylic acid having the formula $R''C(O)OH$; and

(c) water to produce an aqueous solution containing about 40 to about 80 percent by weight of a compound having the formula $R'C(O)O^-+M.R''C(O)OH$

wherein:

R′ and R″ are independently selected from the group consisting of methyl, ethyl, propyl, iso-propyl, butyl, isobutyl, tert-butyl and benzyl; and

M is selected from the group consisting of sodium, potassium, and calcium.

4,401,625

APPARATUS FOR PREPARING TEST SAMPLES

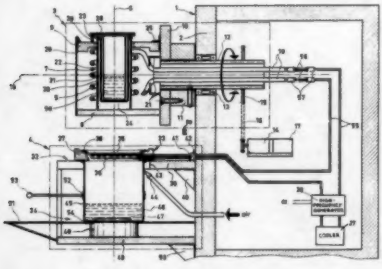
Gerard Willay, Ars sur Moselle, and Andre Wittmann, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Jul. 17, 1981, Ser. No. 284,453

Claims priority, application France, Jul. 24, 1980, 80 16410

Int. Cl.³ G01N *1/28*

U.S. Cl. 422—50 **9 Claims**



1. An apparatus for preparing a test sample comprising:

a support defining an upper melting station and a lower station,

an electric coil on said support at said upper melting station;

a crucible receivable in said coil and formed by an outer vessel at least partially of a noble metal and by an inner vessel formed of a rigid refractory material that is a good conductor of heat and that is not wettable by said sample; means for supplying electricity to said coil and thereby heating said crucible and the sample therein for melting the sample;

a dissolving receptacle at said lower station;

a bath of a solvent for said sample in said dissolving receptacle;

a magnetic mixing element in said dissolving receptacle;

a magnetic agitator in said support for said mixing element; and

means for tipping said crucible about a horizontal axis relative to said support and thereby pouring the melted sample in said crucible down into said receptacle in said lower station.

4,401,626

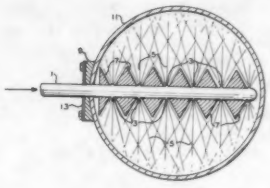
SPRAY DEVICE USEFUL IN CARBON BLACK REACTOR

Robert J. Lewis, Hopkins, Minn., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 17, 1979, Ser. No. 39,930

Int. Cl.³ C01B *49/00*; C09C *1/48*

U.S. Cl. 422—151 **4 Claims**



1. A quench pipe comprising:

(1) a plurality of discharge openings along its length arranged as two longitudinally spaced sets 180° apart to produce a patterned fluid spray with spaces between said openings which are void of spray;

(2) means for inserting said quench pipe into a quench zone so that fluid is discharged from the pipe generally transversely across the quench zone; and

(3) baffle plates aligned on said quench pipe between said discharge openings, said plates of sufficient size, shape and placement substantially to fill spaces between said patterned spray so that axial flow through the quench zone is directed into the patterned spray.

4,401,627

DEVICE FOR IRRADIATING ISOTOPE MIXTURES ISOTOPE -SELECTIVELY

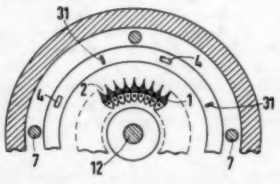
Karl Janner, Erlangen, and Klaus Gregorius, Neunkirchen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim (Ruhr), Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,286

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939506

Int. Cl.³ B01J *19/08*

U.S. Cl. 422—186 **8 Claims**



1. Apparatus for adiabatic expansion and isotope-selective irradiation of gaseous isotope mixtures to which supplemental gas may be added, with a coherent electromagnetic radiation source tuned to a suitable frequency for the purpose of enriching one isotope in the isotope mixture, which comprises a housing, a central gas inlet opening in said housing for passage of entering gaseous isotope mixtures centrally through said housing, a multiplicity of radially-directed slot nozzles in the housing which are arranged axis-parallel to each other on an imagined cylinder surface encircling said central passage of gaseous isotope mixtures through the housing, a radiation zone which forms a cylinder surface around said slot nozzles, a radiation window in said housing for the passage of radiation into said radiation zone, a multiplicity of diffusers concentric with said cylinder surface of the slot nozzles arranged around said radiation zone, and at least one gas outlet in said housing

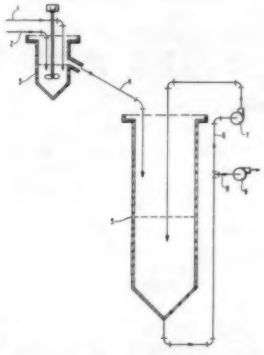
for discharge of gases from said diffusers, and wherein the slot nozzles, as seen in the axial directions, consist of several individual lengths which are mounted and aligned relative to each other via dowel pins and centering rings.

4,401,628

PROCESS FOR MAKING HIGH QUALITY NUCLEAR FUEL GRADE AMMONIUM DIURANATE FROM URANYL FLUORIDE SOLUTIONS

Peter T. Chiang, Monroeville, Pa., and Erich W. Tiepel, Littleton, Colo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1981, Ser. No. 226,336
Int. Cl.³ C01G 56/00
U.S. Cl. 423—15 10 Claims



1. A continuous process for precipitating ammonium diuranate from an aqueous solution of uranyl fluoride comprising

(A) forming undersized ammonium diuranate particles in a first container by mixing said aqueous solution and an ammonium hydroxide solution containing about 10 to about 30% by weight ammonia, in a ratio of about 20 to about 30 moles of ammonia per mole of uranium, at a temperature of up to about 50° C. a residence time in said first container of about 14 to about 57 seconds; and

(B) transporting said slurry to a second container and agitating it in said second container for further particle growth at a temperature of up to about 40° C. for a residence time of about 2 to about 9 minutes.

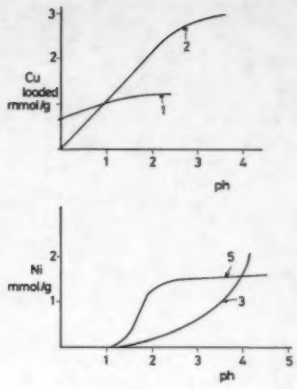
4,401,629

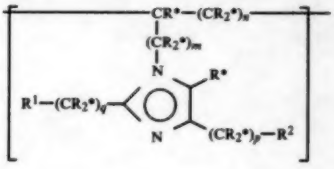
SELECTIVE IMIDAZOLE ION EXCHANGE RESINS

Robert D. Hancock, Bryanston, and Brian R. Green, Roodepoort, both of South Africa, assignors to National Institute for Metallurgy, Randburg, South Africa

Filed Mar. 10, 1981, Ser. No. 242,410
Claims priority, application South Africa, Mar. 12, 1980, 80/1458
Int. Cl.³ B01J 39/20; C08F 226/06
U.S. Cl. 423—24 18 Claims

1. A polymeric ion exchange resin composed essentially of cross-linked recurring units of the following formula:





wherein:

n is 1, 2 or 3

m is 0, 1 or 2

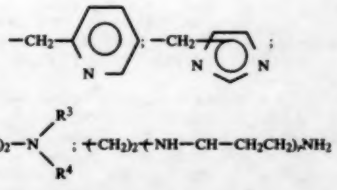
q is 0 or 1

p is 0 or 1

each R* independently of the others is selected from hydrogen and any substituent which will not affect the ion exchange properties adversely and which will preferably enhance same, and,

R^1 and R^2, independently of each other represent hydrogen, optionally substituted pyridyl, optionally substituted imidazolyl or the group

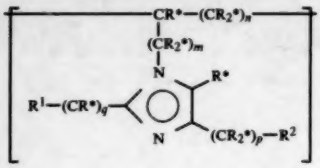
in which R^3 and R^4 independently of each other, is hydrogen, an optionally substituted alkyl radical, or one of the following groups:



in which r is an integer of from 1 to 3.

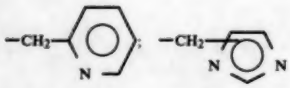
17. A method of selectively separating copper from nickel from a solution containing copper, nickel and optionally cobalt, comprising the steps of:

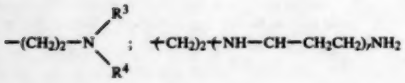
(1) contacting said solution at a copper absorbing pH with a polymeric ion exchange resin composed essentially of cross-linked recurring units of the following formula:



wherein:
n is 1, 2 or 3
m is 0, 1 or 2
q is 0 or 1
p is 0 or 1
each R* independently of the others is selected from hydrogen and any substituent which will not affect the ion exchange properties adversely and which will preferably enhance same, and,
R^1 and R^2, independently of each other represent hydrogen, optionally substituted pyridyl, optionally substituted imidazolyl or the group

in which R^3 and R^4 independently of each other, is hydrogen, an optionally substituted alkyl radical, or one of the following groups:





in which r is an integer of from 1 to 3; and thereafter
(2) removing the copper absorbed on said ion exchange resin by lowering the pH.

4,401,630

PROCESS FOR COBALT RECOVERY FROM MIXED SULFIDES

Victor A. Ettel, and Juraj Babjak, both of Mississauga, Canada, assignors to INCO Ltd., Toronto, Canada

Filed Aug. 31, 1981, Ser. No. 298,208
Claims priority, application Canada, Dec. 23, 1980, 367465
Int. Cl.³ C01G *51/00, 53/11, 3/12;* C22B *3/00*
U.S. Cl. 423—34 **7 Claims**

1. A process resulting in the preferential recovery of cobalt occurring from the separation of cobalt, nickel, and copper values contained in a precipitated cobalt, nickel and copper sulfide feed material, the process comprising:
(a) slurrying the sulfide material in an aqueous medium essentially free of sulfuric acid to provide a slurry containing about 5% to about 30% solids by weight, the slurry not exceeding 10 grams of ammonia per liter, the pH of the slurry ranging from about 5 to 8 pH units,
(b) oxidatively leaching the slurry at atmospheric pressure by aerating the slurry with an oxygen-containing gas, such as air,
(c) agitating the slurry for a predetermined time to dissolve substantial portions of cobalt and nickel in the slurry,
(d) upon completion of step (c) above, limiting the concentration of dissolved copper in the slurry by metatheticaly leaching the slurry in the absence of gas aeration and by adjusting the pH of the slurry to about 5 pH units to increase the concentration of cobalt and nickel while simultaneously reducing the concentration of copper,
(e) recovering a leach liquor from the slurry containing the dissolved cobalt and nickel values, and
(f) selectively recovering the cobalt from the leach liquor.

4,401,631

PROCESS FOR THE RECOVERY OF MOLYBDENUM FROM MIXTURES OF MOLYBDENUM COMPOUNDS WITH OTHER METALLIC COMPOUNDS

Roberto Canavesi, Bollate; Ferdinando Ligorati, Usmate; Roberto Ghezzi, Cusano Milanino, and Roberto Clemente, Milan, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Dec. 19, 1980, Ser. No. 218,225
Claims priority, application Italy, Dec. 19, 1979, 28223 A/79
Int. Cl.³ C01G *39/00*
U.S. Cl. 423—54 **5 Claims**

1. A process for recovering molybdenum from an exhausted catalyst selected from the group consisting of
(a) catalysts for the oxidation of methanol to formaldehyde, formed of molybdenum and iron oxides and containing at most minor amounts of cobalt or nickel oxide and
(b) hydrogenation catalysts formed of molybdenum and cobalt and/or nickel oxide, unsupported or supported on an inert carrier, which comprises
(1) contacting said exhausted catalyst with an aqueous solution of sodium hydroxide having a concentration of from 2 to 15% by wt. at a temperature of from ambient temperature to 70° C., for a period from 1 to 4 hours and at pH of from 9.5 to 13 to solubilize molybdenum in the form of sodium molybdate,
(2) filtering off the solid residue obtained from the aqueous solution present,
(3) percolating the aqueous solution thus obtained in step (2) having a content of from 2 to 20% by wt. of sodium molybdate through a strong cationic exchange resin to convert said molybdate in said aqueous solution into molybdic acid and
(4) recovering the resulting aqueous solution of molybdic acid of step (3).

4,401,632

RECOVERY OF ARSENIC FROM FLUE DUST

Brent W. Madsen, Bountiful; Henry Dolezal; Philip A. Bloom, both of Salt Lake City, and Monte B. Shirts, South Jordan, all of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation of Ser. No. 225,238, Jan. 15, 1981, abandoned. This application Feb. 11, 1982, Ser. No. 348,118
Int. Cl.³ C01G *28/00*
U.S. Cl. 423—87 **1 Claim**

1. A process for removal and recovery of arsenic from arsenical flue dusts comprising: (1) forming an aqueous slurry of the flue dust, (2) treating said slurry with sulfur dioxide gas to reduce and solubilize arsenic, (3) filtering to separate insoluble residue, (4) treating the filtrate with sulfuric acid in an amount sufficient to provide a solution of about 40 to 50 percent acid, (5) cooling the solution to about 25° C. or less to precipitate arsenic trioxide, (6) filtering to separate the arsenic trioxide, and (7) treating the filtrate from step (6) with granules of hydrated titanium dioxide to absorb additional arsenic.

4,401,633
TWO STEP PROCESS FOR THE PREPARATION OF ZEOLITE A BY HYDROTHERMAL TREATMENT OF HEULANDITE

Hsiang-ning Sun, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 28, 1982, Ser. No. 343,647
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—118 12 Claims

1. A hydrothermal process for the preparation of a sodium cation form of zeolite A from natural heulandite of the formula

$$Ca\ \tfrac{1}{2}x(AlO_2)_x(SiO_2)_y.ZH_2O$$

wherein x=5 to 7, y/x=4.5 to 5.5 and z=1 to 30 which comprises the steps of:

(a) heating at a temperature of from about 60° C. to 110° C. said natural heulandite in a 1 to 30 weight percent aqueous solution of sodium hydroxide to dissolve heulandite, the heulandite having a concentration of at least one gram heulandite per 100 cc of aqueous sodium hydroxide solution;

(b) filtering the heulandite-sodium hydroxide solution to remove undissolved heulandite and elemental impurities and form a filtrate;

(c) reacting the filtrate at a temperature of from about 60° C. to 110° C. in the presence of up to 15 weight percent of NaCl with at least 75 percent of a stoichiometric amount of sodium aluminate in an aqueous solution to precipitate and form zeolite A having a mean particle size of about 3 to 6 microns, said sodium aluminate having a concentration of from 1 to 16.5 weight percent in water; and

recovering said zeolite A.

4,401,634
TWO STEP PROCESS FOR THE PREPARATION OF ZEOLITE A BY HYDROTHERMAL TREATMENT OF CLINOPTILOLITE

Hsiang-ning Sun, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 28, 1982, Ser. No. 343,648
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—118 12 Claims

1. A hydrothermal process for the preparation of a sodium cation form of zeolite A from natural clinoptilolite of the formula

$$Na_x(AlO_2)_x(SiO_2)_y.ZH_2O$$

wherein x=5 to 7, y/x=4.5 to 5.5 and z=1 to 30 which comprises the steps of:

(a) heating at a temperature of from about 60° C. to 110° C. said natural clinoptilolite in a 1 to 30 weight percent aqueous solution of sodium hydroxide to dissolve clinoptilolite, the clinoptilolite having a concentration of at least one gram clinoptilolite per 100 cc of aqueous sodium hydroxide solution;

(b) filtering the clinoptilolite-sodium hydroxide solution to remove undissolved clinoptilolite and elemental impurities and form a filtrate;

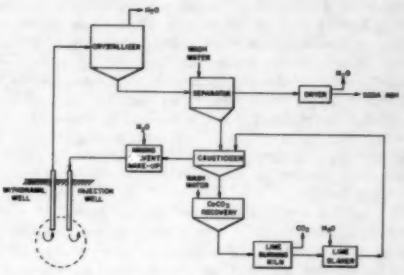
(c) reacting the filtrate at a temperature of from about 60° C. to 110° C. in the presence of up to 15 weight percent NaCl with at least 75 percent of a stoichiometric amount of sodium aluminate in an aqueous solution to precipitate and form zeolite A having a mean particle size of about 3 to 6 microns, said sodium aluminate having a concentration of from 1 to 16.5 weight percent in water; and

recovering said zeolite A.

4,401,635
RECOVERY OF ALKALI VALUES FROM SALT-CONTAINING TRONA DEPOSITS

William R. Frint, Green River, Wyo., assignor to Intermountain Research and Development Corporation, Green River, Wyo.

Continuation-in-part of Ser. No. 93,353, Nov. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 5,523, Jan. 22, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,288
Int. Cl.³ C22B *26/10*; C01D *7/00*; E21C *41/08*
U.S. Cl. 423—206 T 7 Claims



1. A cyclic method for recovering alkali values from underground trona deposits associated with substantial deposits of sodium chloride, which comprises

(i) introducing into the region of a trona deposit associated with substantial amounts of sodium chloride an aqueous NaCl-containing mining solvent resulting from the process set forth below and having dissolved therein from about 2 to 7% by weight sodium hydroxide to effect dissolution of trona as sodium carbonate;

(ii) withdrawing from the region a portion of the resulting mining solution essentially saturated with sodium chloride and low in sodium bicarbonate content, the volume of solution being left in the region of the trona deposit to replace dissolved trona being insufficient as a purge to maintain the sodium chloride level in the withdrawn solution below an essentially saturated level;

(iii) fractionally crystallizing dissolved sodium carbonate from the withdrawn mining solution as sodium carbonate monohydrate by introducing ammonia into the solution at a temperature of from 30° to 50° C., leaving in solution essentially all of the sodium chloride and leaving sufficient sodium carbonate dissolved in solution to yield the required sodium hydroxide concentration in the aqueous mining solvent prepared in steps (v) and (vi) set forth below;

(iv) separating the crystallized solid from the mining solution and thereafter recovering the ammonia from the mining solution;

(v) causticizing mining solution to convert sodium carbonate remaining in solution to sodium hydroxide;

(vi) adding sufficient water to the mining solution to compensate substantially for that in the volume of solvent left in the region of the trona deposit and to result in an aqueous mining solution containing from about 2 to 7% by weight sodium hydroxide and essentially all of the sodium chloride withdrawn from the region of the trona deposit, the sodium chloride concentration being at least 5% by weight; and

(vii) reintroducing the resulting aqueous mining solution, containing essentially all of the sodium chloride withdrawn from the region of the trona deposit, into the region of the trona deposit and repeating the cycle of recovery.

4,401,636
NOVEL METAL-MICELLE ASBESTOS AND TREATMENT OF ASBESTOS AND OTHER SILICATE MINERALS TO REDUCE THEIR HARMFUL PROPERTIES

Earl S. Flowers, Petaluma, Calif., assignor to Flow General, Inc., McLean, Va.

Continuation-in-part of Ser. No. 110,455, Jan. 8, 1980, Pat. No. 4,328,197. This application Feb. 8, 1982, Ser. No. 346,855

Int. Cl.³ C01B *33/20, 33/22*

U.S. Cl. 423—327 **9 Claims**

1. A method for making metal-micelle polymer asbestos comprising the step of contacting asbestos fibres with a metal-strong base-weak acid ion system, wherein said system comprises an aqueous solution of a cation from a strong base and an anion from a metal ion system constituting a weak acid, whereby said metal-strong base-weak acid ion system forms a metal-micelle polymer asbestos by inducing formation of a metal-micelle polymer coating on said asbestos fibre, said polymer coating being ionically bonded to said asbestos fibre, and wherein said metal is selected from the group consisting of manganese, chromium, cobalt, iron, copper, aluminum and mixtures thereof.

9. A metal-micelle polymer asbestos comprising the reaction product of asbestos fibres with a metal-strong base-weak acid ion system, wherein said system comprises an aqueous solution of a cation from a strong base and an anion from a metal ion system constituting a weak acid and wherein said metal is selected from the group consisting of manganese, chromium, cobalt, iron, copper, aluminum and mixtures thereof.

4,401,637
CRYSTALLINE ISOTACTIC ZEOLITES AND THEIR PREPARATION

Laszlo Marosi, Ludwigshafen; Joachim Stabenow, Weinheim, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,925

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006471

Int. Cl.³ C01B *33/28;* C07F *5/06;* B01D *29/16*

U.S. Cl. 423—329 **11 Claims**

1. A process for the preparation of a crystalline isotactic zeolite of the composition

$$2/nR.W_2O_3.mYO_2.PH_2O$$

where R is an organic amine having a lower basicity than that of an alkali base or of a quatenary nitrogen base and n is the number of amine groups in the amine molecule, W is selected from the group comprising B, Al, Ga, Fe or any combination thereof, Y is selected from the group comprising Si, Ge or any combination thereof, and m is

$$m = (1 \pm 0.15)\frac{96 - \frac{40\,n}{L_R + K}}{\frac{20\,n}{L_R + K}}$$

where L_R is the length of the amine molecule in A, K is a constant having a value of 4, p is a number of from 0 to 160 and the crystalline isotactic zeolite material exhibits one or more of the following diffraction lines $d(A) = 11.1 \pm 0.3/10.0 \pm 0.25/3.85 \pm 0.1/3.71 \pm 0.1/3.54 \pm 0.07$ from a mixture of YO_2 and W_2O_3 by hydrothermal crystallization at from 100 to 200° C., wherein the crystallization is carried out in the absence of an alkali metal base, alkaline earth metal base and quaternary nitrogen base and their intermediates, with the aid of an organic amine, the molar ratio of YO_2 to W_2O_3 in the reaction mixture being brought to a value, depending on the chain length L_R of the organic amine, which is appropriate for the formation of the isotactic zeolite, the molar ratio H_2O/amine being from 0.4 to 100 and molar ratio amine/Al_2O_3 being from 5 to 400.

4,401,638
PROCESS FOR PURIFYING SILICA SAND

Alejandro J. Caballero, and Ricardo I. Holcombe, both of Monterrey, Mexico, assignors to Materias Primas, Monterrey, S.A., Monterrey, Mexico

Filed Dec. 21, 1981, Ser. No. 333,257

Int. Cl.³ C01B *33/12*

U.S. Cl. 423—340 **8 Claims**

1. A process of purifying silica sand comprising:

a. grinding sandstone to obtain sand particles;

b. washing and desliming said particles to remove a major portion of clay-type binder contained in said sandstone;

c. attrition-scrubbing said deslimed sand particles to release further amounts of said binder from said particles;

d. further washing and desliming said sand thereby essentially removing said further amounts of said binder;

e. drying and heating said sand;

f. treating said hot sand particles with a solution of sulfuric acid to convert at least one of impurities selected from the group consisting of iron oxides, ferro-silicates and ferro-aluminous compounds into water soluble compounds;

g. attrition-scrubbing the resulting hot suspension of said acid treated sand particles to release strongly adhering stains of said impurities from said particles;

h. washing said suspension with cold water and desliming;

i. conditioning said suspension with collectors and frother;

j. floating and removing at least one of remaining ferrosilicates and iron oxides in a first flotation step conducted at a pH ranging from 1.5 to 7; and

k. floating and removing remaining aluminosilicates in a second flotation step using a fatty amine collector in the presence of at least one activator selected from the group consisting of sulfuric acid and hydrofluoric acid.

4,401,639
PREPARATION OF CARBONYL CYANIDE

Bruce I. Rosen, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 24, 1982, Ser. No. 391,752

Int. Cl.³ C01C *3/14*

U.S. Cl. 423—365 **12 Claims**

1. A method of preparing carbonyl cyanide comprising reacting the solution of a trihalomethyl haloformate, $X_3CO(-CO)Y$, in an organic solvent with a cyanide salt in the presence of a phase transfer catalyst, and recovering the formed carbonyl cyanide.

4,401,640
HYDROGENATION CATALYSTS

Gerhard P. Nowack; Marvin M. Johnson, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 289,350, Aug. 3, 1981, which is a continuation of Ser. No. 111,053, Jan. 10, 1980, abandoned. This application Sep. 21, 1982, Ser. No. 420,779

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.³ C01C *3/11*

U.S. Cl. 423—367 **1 Claim**

1. Iron (II) hexacyanocobaltate.

4,401,641
PROCESS FOR PREPARING CATALYST CARRIER OF MAGNESIUM CHLORIDE

Enrico Albizzati, Arona; Ivano Bassi, Cologno Monzese; Giorgio Foschini, Ferrara; Sandro Parodi, Oleggio, and Franco Pirinoli, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 180,478, Aug. 22, 1980, abandoned, which is a continuation of Ser. No. 940,115, Sep. 6, 1978, abandoned, which is a continuation of Ser. No. 763,672, Jan. 28, 1977, abandoned. This application Dec. 28, 1981, Ser. No. 335,154

Claims priority, application Italy, Jan. 30, 1976, 19749 A/76

Int. Cl.³ C01F *5/32*

U.S. Cl. 423—498 **1 Claim**

1. Process for preparing a carrier for catalysts for the polymerization of olefins and consisting of practically anhydrous magnesium chloride, which process comprises first treating hydrated magnesium chloride with thionyl chloride at a temperature between 25° C. and 60° C. and then treating the product thus obtained with boiling thionyl chloride to obtain a white crystalline solid practically free of H_2O, the composition of which corresponds to that of $MgCl_2$, and which shows an X-rays diffraction spectrum in which the reflection lines of maximum intensity appear at the following lattice distances:

d=5.90 A intensity f

d=2.77 A intensity ff

d=1.814 A intensity f.

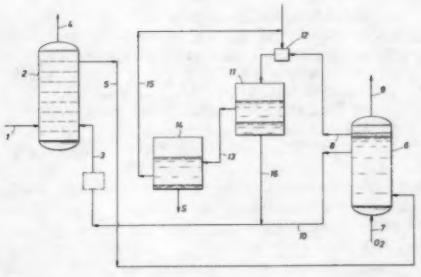
4,401,642
FROTH PROCESS

George C. Blytas, and Zaida Diaz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 267,182, May 26, 1981, abandoned. This application Mar. 26, 1982, Ser. No. 362,338

Int. Cl.³ C01B *17/04*; B01D *53/34*

U.S. Cl. 423—573 G **15 Claims**



1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the mixture comprising an effective amount of a reactant selected from the group consisting of polyvalent metallic ions and polyvalent metal chelate compounds, and mixtures thereof, to produce a sweet gas stream and an aqueous mixture containing crystalline sulfur and a reduced reactant;

(b) removing aqueous admixture from the contacting zone and contacting said aqueous admixture in a regeneration zone with an oxygen-containing gas under conditions to produce a regenerated aqueous admixture containing regenerated reactant and a froth containing sulfur and aqueous admixture;

(c) removing froth from the regeneration zone and contacting said froth with a liquid extracting composition selected from compounds having the formula $C_nH_{2n+1}OH$, wherein n is a whole number from 4 through 15, and compounds having the formula $C_nH_{2n-1}OH$, wherein n is a whole number from 4 through 20, and mixtures thereof, in an amount sufficient to remove at least the bulk of the sulfur from the froth and produce a separate liquid layer containing sulfur and said composition, and forming a three-phase mass comprising an upper liquid layer comprising solid sulfur and said composition, and a lower layer in contact with said upper layer, said lower layer comprising regenerated aqueous admixture;

(d) separating at least a portion of the upper liquid layer, and recovering sulfur from the portion separated;

(e) returning regenerated aqueous admixture from the regeneration zone to the contacting zone.

4,401,643
PREPARATION OF FINELY DIVIDED BARIUM FERRITE OF HIGH COERCIVITY

Hartmut Hibst, Ludwigshafen, and Helmut Jakusch, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,180

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042959

Int. Cl.³ C01G *49/00*

U.S. Cl. 423—594 **3 Claims**

1. A process for the preparation of barium ferrite of the formula $BaFe_{12}Fe_{19}$ which comprises:

(a) mixing an aqueous solution of a barium compound selected from the group consisting of barium chloride, barium sulfate and barium carbonate with an aqueous solution or an iron(III) compound selected from the group consisting of iron(III) chloride and iron(III) sulfate;

(b) reacting the mixture formed in step (a) with an aqueous sodium carbonate solution;

(c) completely dehydrating the resulting mixture from step (b) which consists essentially of sparingly soluble barium compound and iron(III) carbonate in an aqueous sodium salt solution;

(d) heating the dry salt mixture from step (c) at a temperature above 680° C. but below the melting point of the sodium salt present; and

(e) leaching the resulting product with water to dissolve the sodium salt and to isolate the finely divided, platelet like barium ferrite.

4,401,644
METHOD FOR OBTAINING SENARMONTITE AND SENARMONTITE THUS OBTAINED

Rene Bloise, Saint Denis en Val; Georges Morizot, Olivet, and Genevieve Boissonnade, Le Pecq, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Aug. 12, 1981, Ser. No. 292,259

Claims priority, application France, Aug. 12, 1980, 80 17802

Int. Cl.³ C01B *27/00*

U.S. Cl. 423—617 **9 Claims**

1. A process for producing synthetic photostable senarmon-

tite by direct hydrolysis of antimony trichloride by means of a basic solution, characterized in that the hydrolysis is carried out in the presence of an oxidizing agent; the quantity of oxidizing agent being sufficient for the oxydo-reduction potential of the hydrolysis medium to be in its stationary phase; and the oxidizing agent being selected from the group consisting of oxygen, hydrogen peroxide, and sodium hypochlorite.

2. A process for producing synthetic photostable senarmontite by direct hydrolysis of antimony trichloride by means of a basic solution, characterized in that the hydrolysis is carried out in the presence of hydrogen peroxide as an oxidizing agent and the basic solution is an ammoniacal solution; in that the hydrogen peroxide is used in an amount between 0.4 and 5% on the basis of the weight of the antimony trichloride; and in that the hydrolysis temperature is comprised between 0° and 100° C.

6. A process for producing synthetic photostable senarmontite by direct hydrolysis of antimony trichloride by means of a basic solution, characterized in that the hydrolysis is carried out in the presence of sodium hypochlorite as an oxidizing agent and the basic solution is an ammonia solution and in that the oxidizing agent is used in an amount between 5 and 15% on the basis of weight of the antimony trichloride.

4,401,645

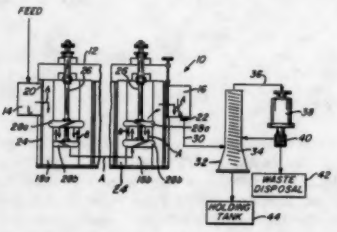
LIME SLAKING METHOD

Henry J. Gisler, Denver, Colo., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 200,811, Jan. 27, 1980, abandoned, which is a division of Ser. No. 16,260, Feb. 28, 1979, abandoned. This application Jun. 1, 1982, Ser. No. 383,446

Int. Cl.³ C01F *11/02*

U.S. Cl. 423—640 **13 Claims**



1. The method of producing hydrated lime comprising the steps of: providing a mass of unhydrated lime particles and water; contacting exterior surface portions of said lime particles with said water to convert said exterior surface portions into hydrated lime; coincident with said converting of said exterior surface portions of said lime particles, agitating said mass between an impeller directing said mass in descending flow and another impeller arranged to interrupt said descending flow and direct a substantial portion of said mass countercurrent to said descending flow so as to promote high intensity interparticle contact among said lime particles; consequent to said promoting high intensity interparticle contact, mechanically removing said hydrated exterior surface portions from said lime particles to expose unhydrated internal portions thereof to said water; and continuing said contacting, agitating, mechanically removing and exposing until substantially all of said lime particles have been converted substantially entirely into hydrated lime.

4,401,646

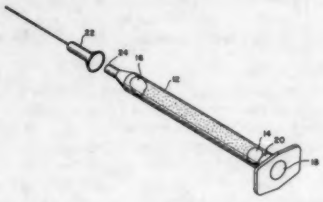
METHOD AND APPARATUS FOR PURIFYING MATERIALS RADIOLABELED WITH TECHNETIUM-99M

Buck A. Rhodes, and David Torvestad, both of Albuquerque, N. Mex., assignors to University Patents Inc., Norwalk, Conn.

Filed May 8, 1981, Ser. No. 261,783

Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1 **11 Claims**



1. The process of purifying a composition labeled with technetium-99m and containing unbound reduced technetium impurity and/or pertechnetate impurity which comprises contacting said labeled composition with a solid particulate substrate containing stannous phthalate precipitated from a saturated solution and a secondary antioxidant, said substrate being capable of binding a technetate ion and capable of retaining unbound reduced technetium impurity and recovering purified labeled composition.

4,401,647

RADIOLABELED NEOGLYCOPEPTIDES

Kenneth A. Krohn; David R. Vera, and Robert C. Stadalnik, all of Sacramento, Calif., assignors to The Regents of the University of CA, Berkeley, Calif.

Filed Mar. 3, 1980, Ser. No. 126,739

Int. Cl.³ A61K *43/00, 37/02, 49/02*

U.S. Cl. 424—1.5 **9 Claims**

1. In a method for clinical scintigraphic hepatic imaging in a host, the improvement which comprises using as the imaging composition a composition comprised of a synthetic neoglycoprotein-Tc-99m conjugate of at least about 20,000 molecular weight and having at least one galactosyl or glucosyl residue per 20,000 molecular weight, said protein being nonimmunogenic to said host and exhibiting negligible biochemical affinity for receptor sites or physiological compartments other than the liver, wherein the amount of Tc-99m is at last 0.10 mCi/mg.

7. A method for diagnosing liver disease states which comprises:

introducing into a host a predetermined amount of a radionuclide-containing radiopharmaceutical specifically binding to hepatocytes of the liver, said radiopharmaceutical comprising a neoglycoprotein-Tc-99m conjugate of at least about 20,000 molecular weight and having at least about one galactosyl or glucosyl residue per 20,000 molecular weight;

monitoring the radioactive emissions from at least one of the regions: liver, urinary bladder, precordium, or carotid artery, and determining data concerning at least two of (1) the rate of uptake of the radionuclide by said region; (2) the emissions from at least one site of said region; and (3) the release of the radionuclide from said region; and

analyzing the data as diagnostic of a liver disease state.

4,401,648

DENTAL CREAM COMPOSITION

Stanley E. Piecbota, Jr., Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,328
Int. Cl.³ A61K 7/16
U.S. Cl. 424—49 4 Claims

1. A non-stringy, easily dispersible dental cream overcoming the stringy, difficult to disperse quality imparted by xanthan comprising about 20–80% by weight of a liquid vehicle phase comprising water and humectant and about 0.2–5% by weight of a gel vehicle phase and dispersed therein about 10–75% of a water-insoluble dentally acceptable polishing agent, said gel vehicle containing a weight ratio of about 3:1 to 1:3 of xanthan to alginate salt.

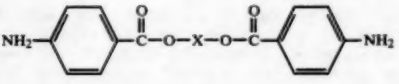
4,401,649

SUNSCREEN METHOD

Milton Green, Newtown Center, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 20, 1981, Ser. No. 284,624
Int. Cl.³ A61K 7/44
U.S. Cl. 424—60 8 Claims

1. A method for protecting against the harmful effects of ultraviolet radiation in the range of 290 nanometers to 320 nanometers comprising topically applying a sunscreen composition comprising a pharmaceutically acceptable carrier having incorporated therein, in an amount effective to provide protection against the harmful effects of ultraviolet radiation, a compound of the formula



wherein X is an alkylene group containing 3 or 5 carbon atoms, said sunscreen composition being applied to the skin in an amount sufficient to provide said protection.

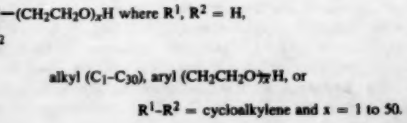
4,401,650

SKIN CONDITIONING POLYMERS CONTAINING ALKOXYLATED NITROGEN SALTS OF SULFONIC ACID

Ann B. Salamone, Marblehead, Mass., assignor to Thiokol Corporation, Chicago, Ill.

Filed Sep. 15, 1981, Ser. No. 302,324
Int. Cl.³ A61K 31/74, 31/78
U.S. Cl. 424—78 22 Claims

1. A method of conditioning skin, comprising: applying a composition containing from 0.1 to 10 wt.% of a polymer made from at least one ethylenically unsaturated addition polymerizable monomer containing an alkoxylated nitrogen salt of sulfonic acid and at least one additional monomer selected from the group consisting of neutral monomers, anionic monomers, or cationic monomers, to skin so as to obtain good conditioning properties; said addition polymerizable monomer being present in a mole fraction of about 0.03 to 1.0; said salt being derived from ethoxylated amine having the following structure:



R^1—N—$(CH_2CH_2O)_xH$ where R^1, R^2 = H,
|
R^2

alkyl (C_1–C_{30}), aryl ($CH_2CH_2O)_{\overline{x}}H$, or

R^1–R^2 = cycloalkylene and x = 1 to 50.

4,401,651

WOUND-HEALING COMPOSITIONS CONTAINING POVIDONE-IODINE

Richard A. Knutson, 130 N. Shelby St., Greenville, Miss. 38701

Continuation-in-part of Ser. No. 31,162, Apr. 18, 1979, abandoned. This application Jul. 22, 1980, Ser. No. 171,261
Int. Cl.³ A61K 31/79, 33/18
U.S. Cl. 424—80 1 Claim

1. A storage-stable, spreadable, adherent, cohesive substantially-homogeneous therapeutically-acceptable antimicrobial ointment or salve which is an admixture comprising 20 parts by weight of ordinary granulated sugar, 5 parts by weight of Betadine ® ointment and 2 parts by weight of Betadine ® solution.

4,401,652

PROCESS FOR THE PREPARATION OF STROMA-FREE HEMOGLOBIN SOLUTIONS

Richard S. Simmonds, Landing, N.J., and Wells P. Owen, Nyack, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 221,640, Dec. 31, 1980, abandoned. This application Aug. 5, 1981, Ser. No. 290,175
Int. Cl.³ A61K 35/14
U.S. Cl. 424—101 15 Claims

1. A method of obtaining stroma-free hemoglobin solution from erythrocytes comprising:

(1) lysing the erythrocytes to form a mixture of stroma and hemoglobin,

(2) precipitating the stroma from the mixture by treating the mixture with effective amounts of a polyvalent cation, a polysulfate, and a polyvalent anion, and

(3) separating the supernatant hemoglobin solution from the precipitate.

4,401,653

COMBINATION OF RAPAMYCIN AND PICIBANIL FOR THE TREATMENT OF TUMORS

Chee P. Eng, Dollard des Ormeaux, Canada, assignor to Ayerst, McKenna & Harrison Inc., Montreal, Canada

Filed Mar. 9, 1981, Ser. No. 241,867
Int. Cl.³ A61K 35/00
U.S. Cl. 424—114 4 Claims

1. A method of reducing tumor size in a tumor bearing mammal or prolonging the survival time in a tumor bearing mammal, wherein said tumor is a transplantable tumor selected from the group consisting of lymphatic leukemia, colon, mammary, meleanocarcinoma and ependymoblastoma, which comprises administering to said mammal an antitumor effective amount of a combination of rapamycin and picibanil, said rapamycin being administered at a daily dose of from 10 to 250 mg per kg of body weight and said picibanil being administered at a daily dose of 0.5 to 5 KE per kg of body weight.

4,401,654

ANTICOAGULANT METHODS WITH SULFUR DIOXIDE

Jose A. A. Alvarez, Mexico, Mexico, assignor to T & R Chemicals, Inc., Clint, Tex.

Continuation of Ser. No. 164,304, Jun. 30, 1980, abandoned. This application Jul. 9, 1981, Ser. No. 281,951
Int. Cl.³ A61K 33/04
U.S. Cl. 424—162 6 Claims

1. A process for inhibiting one of mammalian blood coagulation factors VII, VIII, IX, X, XI and XII, said process comprising adding to a mammalian fluid selected from the group consisting of blood and blood plasma a solution of sulfur dioxide present in an anticoagulantly effective amount.

4,401,655

ANTITHROMBOTIC TREATMENT WITH SALTS OF SULFITES AND BISULFITES

Jose A. A. Alvarez, Carpatos, Mexico, assignor to T & R Chemicals, Inc., Clint, Tex.

Continuation-in-part of Ser. No. 271,850, Jun. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 227,382, Jan. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 164,845, Jun. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 75,424, Sep. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 859,705, Dec. 12, 1977, abandoned. This application Jan. 5, 1982, Ser. No. 337,176

Int. Cl.³ A61K *33/04*

U.S. Cl. 424—162 **19 Claims**

1. A method for treating a thrombotic condition in a mammal comprising administering to said mammal an antithrombotically effective amount of at least one pharmaceutically acceptable agent selected from the group consisting of alkali metals, alkaline earth metals, and ammonium salts of sulfites and bisulfites and mixtures thereof.

4,401,656

N-SUBSTITUTED DIMERIC CYCLOPEPTIDE DERIVATIVES

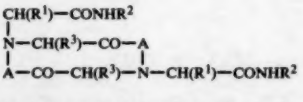
Amedeo Failli, St. Laurent; Hans U. Immer, Mount Royal, and Manfred K. Götz, Hudson, all of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Division of Ser. No. 941,532, Sep. 11, 1978, Pat. No. 4,252,795. This application Sep. 22, 1980, Ser. No. 189,458

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **12 Claims**

1. A compound of formula I



(I)

in which A is a peptide residue having one to four amino acid residues wherein said amino acid residues have a side chain selected from hydrogen or lower alkyl; R^1 is lower alkyl, phenyl or phenyl(lower)alkylene; R^2 is lower alkyl, cyclo(lower)alkyl or lower alkoxycarbonyl(lower)alkylene; and R^3 is a amino acid side chain selected from hydrogen or lower alkyl.

4,401,657

NUTRIENT COMPOSITION SUITABLE FOR ENTERAL FEEDING

Norio Kashiwabara, Tokyo; Hirotaka Maruyama, Kawagoe; Tetuo Ishii, Hidaka, and Satoru Kondo, Tokyo, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Dec. 9, 1981, Ser. No. 328,996

Claims priority, application Japan, Dec. 27, 1980, 55-185079

Int. Cl.³ A61K *37/02*

U.S. Cl. 424—177 **4 Claims**

1. A nutrient composition of low-residue diet based on protein source, fat source and carbohydrate source, having other nutritive components combined with said sources, suitably applicable for enteral feeding, which comprises 20 to 40% by weight of skim milk powder, obtained by decomposing 50 to 95% by weight of lactose contained in the original skim milk powder, as a kind of said protein source and 5 to 15% by weight of medium chain triglycerides as a kind of said fat source.

4,401,658

TRI-, TETRA, AND PENTA-PEPTIDES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Jean Bouchaudon, Morsang-sur-Orge; Gilles Dutruc-Rosset, Paris; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

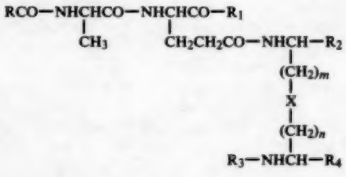
Filed Dec. 17, 1981, Ser. No. 331,593

Claims priority, application France, Dec. 19, 1980, 80 27020

Int. Cl.³ C07C *103/52*; A61K *37/02*

U.S. Cl. 424—177 **10 Claims**

1. A tri-, tetra- or penta-peptide of the general formula:



in which RCO— represents a fatty acid residue in which R represents an alkyl radical containing 1 to 44 carbon atoms (which is optionally substituted by a hydroxyl, phenyl or cyclohexyl radical), an alkenyl radical containing 2 to 29 carbon atoms, which can contain more than one double bond, or a mycolic acid residue such as encountered in the structure of the bacterial wall of mycobacteria, Nocardia or Corynebacteria, R_1 represents a hydroxyl or amino radical, an alkoxy radical containing 1 to 4 carbon atoms or a benzyloxy radical, the symbols R_2 and R_4, which are identical or different, represent a hydrogen atom, a carboxyl or carbamoyl radical, an alkoxycarbonyl radical of which the alkyl part contains 1 to 4 carbon atoms, a benzyloxycarbonyl radical or an N-carbonylglycyl or N-carbonyl-D-alanyl radical optionally esterified by an alkyl radical containing 1 to 4 carbon atoms or a benzyl radical, it being understood that R_2 and R_4 cannot simultaneously represent a hydrogen atom, R_3 represents a hydrogen atom or a glycyl or D-alanyl residue, it being understood that if R_2 and R_4, which are identical or different, each represent an N-carbonylglycyl or N-carbonyl-D-alanyl radical, R_3 represents a hydrogen atom, X represents a sulphur atom or a methylene radical, and m and n, which are identical or different, each represent an integer equal to 1 or 2, it being understood that if X represents a methylene radical, m and n cannot simultaneously be equal to 1, and it being understood that the alanine bonded to the glutamic acid is in the L form, the glutamic acid is in the D form, the lanthionine, if X represents a sulphur atom and m and n are equal to 1, the cystathionine, if X represents a sulphur atom and m and n are different, the homolanthionine, if X represents a sulphur atom and m and n are equal to 2, and the 2,7-diaminosuberic acid, if X represents a methylene radical and one of the symbols m or n is equal to 1 and the other is equal to 2, are in the D,D, L,L, D,D/L,L (racemic) or D,L (meso) form or in the form of L/meso or D/meso mixtures, and the thialysine, if one of the symbols R_2 or R_4 represents a hydrogen atom, X represents a sulphur atom and m and n are equal to 1, is in the L, D or D,L form, or a non-toxic salt thereof.

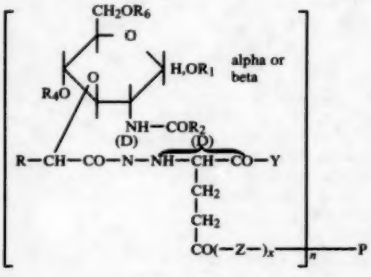
4,401,659

MURAMYL-PEPTIDES FIXED TO PEPTIDE-POLYMERS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Pierre Lefrancier, Bures sur Yvette; Monique Parant, Paris; Francoise Audibert, Neuilly sur Seine; Louis Chedid; Jean Choay, both of Paris, all of France; Michael Sela, Rehovot, Israel, and Edgar Lederer, Sceaux, France, assignors to Agence National de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jan. 14, 1980, Ser. No. 111,701
Claims priority, application France, Jan. 12, 1979, 79 00819
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 30 Claims

1. A pharmacologically active oligomeric peptide derivative which comprises (1) a polylysyl chain P which optionally includes branched chains formed of alanyl residues attached to the chain through the amino groups of lysyl groups in the chain not linked in the forming of said chain and (2) covalently linked to amino groups not linked into said chain P, muramyl peptide groups which comprise a glucopyranoside ring and linked thereto a peptide chain which chain comprises aminoacyl residues, the first of said aminoacyl residues being of an amino acid of the D-series and the second amino acyl residue being of D-glutamic acid, said oligomeric peptide derivative having the formula:



in which the substituents R, R_1, R_2, R_4, R_6, X, Y, Z, x and n are defined as follows:

R is either a hydrogen atom or alkyl group having from 1 to 4 carbon atoms,

R_1 is hydrogen or alkyl having at most 4 carbon atoms or a simple or substituted aryl or alkyl-aryl having at most 10 carbon atoms,

R_2 is hydrogen or alkyl, aryl or alkyl-aryl optionally substituted and having at most 22 carbon atoms,

R_4 is hydrogen or acyl having at most 4 carbons,

R_6 is hydrogen, a saturated or unsaturated acyl optionally branched having from 1 to about 90 carbon atoms and optionally having groups selected from the class consisting of hydroxyl, carboxyl, amino, cyclopropyl and methoxyl,

X is an aminoacyl residue of the (D) series, selected from the class consisting of alanyl, arginyl, asparagyl, aspartyl, cystenyl, glutaminyl, glutamyl, histidyl, hydroxyprolyl, isoleucyl, leucyl, lysyl, methionyl, ornithyl, phenylalanyl, prolyl, seryl, threonyl, tryptophanyl, tyrosyl and valyl,

Y is either —OH, or alkoxy having from 1 to 10 carbon atoms or —NH_2 group, of which one or the two hydrogens is optionally substituted by an alkyl having from 1 to 10 carbon atoms,

Z is from 1 to 3 L- or D- identical or different aminoacyl residues,

x is zero or an integer of 1 through 3, and

n is a an integer other than zero, which integer is not more than the number of amino groups of chain P.

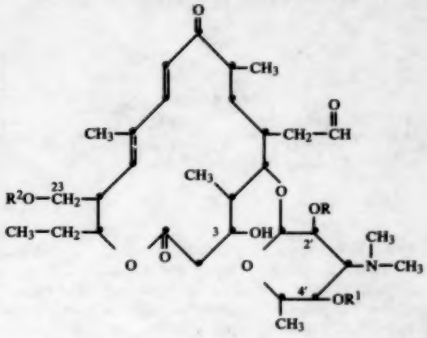
4,401,660

ESTER DERIVATIVES OF 5-O-MYCAMINOSYL TYLONOLIDE AND METHOD OF USING SAME

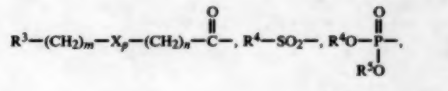
Herbert A. Kirst, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

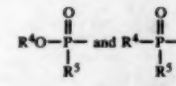
Filed Dec. 14, 1981, Ser. No. 330,341
Int. Cl.³ A61K *31/71*; C07H *17/08*
U.S. Cl. 424—180 119 Claims

1. A compound of the formula



wherein R and R^1 are selected from hydrogen, C_1–C_5-alkanoyl, C_1–C_5-alkanoyl having from one to three halo substituents, benzoyl, phenylacetyl or phenylpropionyl or benzoyl, phenylacetyl, or phenylpropionyl each having on the phenyl ring from one to five halo or methyl or from one to two methoxyl, nitro or hydroxyl groups; R^2 is hydrogen or an acyl group selected from:





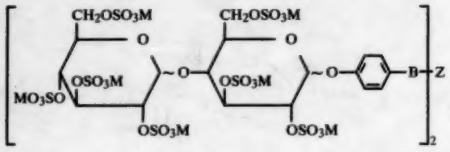
p is 0 or 1; and m and n are integers from 0 to 4; R^3 is hydrogen, halo, C_1–C_4-alkyl, C_3–C_8-cycloalkyl, phenyl, C_5–C_8-cycloalkenyl, naphthyl, indenyl, tetralinyl, decalinyl, adamantyl, 1-ethyl-1,4-dihydro-4-oxo[1,3]dioxolo[4,5-g]cinnolin-3-yl, a monocyclic heterocyclic ring system comprising 3 to 8 atoms or a bicyclic heterocyclic ring system comprising 6 to 11 atoms, provided that at least 1 atom of the ring system is carbon and at least 1 atom of the ring system is a heteroatom selected from O, N, and S; and wherein R^3 and the connecting alkyl groups —$(CH_2)_m$— and —$(CH_2)_n$— can have one or two halo, methyl, ethyl, methoxy, amino, tert-butoxycarbonylamino, methylamino, dimethylamino, nitro, acetoxy, acetamido, azido, carbomethoxy, carboxamido, cyano, or hydroxyl groups, provided that, when the substituent is other than halo or alkyl, there can be no more than one substituent on any connecting —CH_2— group; X is O, S, —NH—, —$N(CH_3)$—, —C≡C—, —CH=CH—, —$C(CH_3)$=CH—, —CH=$C(CH_3)$— or —$C(CH_3)$=$C(CH_3)$—; R^4 and R^5 are C_1–C_5-alkyl, phenyl or benzyl or phenyl or benzyl each having on the phenyl ring from one to five halo or methyl or from one to two methoxy, nitro or hydroxyl groups; provided that at least one of R, R^1 and R^2 must be other than hydrogen and that, when R^1 is other than hydrogen, R must also be other than hydrogen; and the acid addition salts thereof.

4,401,661
N,N'-BIS(GLUCOPYRANOSYL-D-GLUCOPYRANOSYLOXYPHENYL)ALKALINE AND METHODS OF USE

Robert E. Schaub, Upper Saddle River, N.J.; Janis Upeslacis, Pomona, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,048
Int. Cl.³ A61K *31/70*; C07H *13/12*
U.S. Cl. 424—180 **22 Claims**

1. A compound selected from those of the formula:



(~ = α or β)

wherein M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, aluminum, ammonia and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); B is selected from the group consisting of —NHCO—, —$NHSO_2$— and —$NHCH_2$—; and Z is a straight or branched chain alkylidene group —$(CH_2)_m$—, where m is an integer 0–12, inclusive, with the proviso that when m is zero or one, B cannot be —NH-SO_2—.

12. A method of modulating the complement system in a warm-blooded animal which comprises administering to said warm-blooded animal an effective complement modulating amount of a pharmaceutically acceptable compound selected from those of the formula of claim **1**.

4,401,662
OLIGOSACCHARIDES HAVING ANTI-XA ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jean-Claude Lormeau, Maromme la Maine; Jean Choay, and Maurice Petitou, both of Paris, all of France, assignors to Choay, S.A., Paris, France

Continuation-in-part of Ser. No. 91,164, Nov. 5, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,545
Claims priority, application United Kingdom, Oct. 5, 1979, 7934673; Jan. 7, 1980, 8000443; Jul. 2, 1980, 8021749; Jul. 2, 1980, 8021750; Sep. 15, 1980, 8029697
Int. Cl.³ A61K *31/725*; C08B *37/10*
U.S. Cl. 424—183 **16 Claims**

1. An oligosaccharide fraction of the heparin chain which oligosaccharide has improved antithrombotic activity in vivo higher than that of heparin (as measured by the Yin-Wessler test), which oligosaccharide fraction (1) comprises not more than 8 saccharide units, (2) of which one is an N-sulfate-3-O-sulfate-D-glucosamine unit (3) has anti-Xa activity at least 10 times that of heparin, (4) specific affinity for AT III, (5) a ratio of Yin-Wessler titer to USP titer of at least 30 and (6) virtually no anticoagulant activity (as determined by the USP test) and, the biologically acceptable salts of said oligosaccharide.

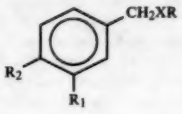
12. A therapeutic antithrombotic composition which has antithrombotic activity higher than that of heparin (as measured by the Yin-Wessler test) which composition comprises a therapeutically acceptable carrier and in a therapeutically effective amount, an oligosaccharide of claims **1, 2, 3, 4, 5, 6, 7, 8, 9, 10,** or **11**.

4,401,663
NOVEL SULFONAMIDE DERIVATIVES

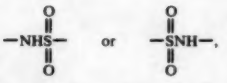
Brian L. Buckwalter, Yardley, Pa., and Thomas R. LaHann, Cleves, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 279,092, Jun. 30, 1981, abandoned. This application Mar. 23, 1982, Ser. No. 360,953
Int. Cl.³ A61K *31/18*; C07C *143/74, 143/84*; A61K *7/155*
U.S. Cl. 424—321 **26 Claims**

1. Compounds of formula:

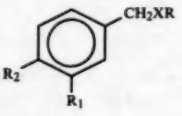


wherein X is

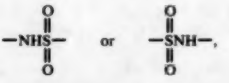


wherein R is C_3–C_{12} alkyl or aralkyl, branched or unbranched, unsubstituted aryl, haloaryl, or C_3–C_{22} alkenyl, branched or unbranched, wherein R_1 is H, OH or OCH_3, and wherein R_2 is H or OH, at least one of R_1 and R_2 being OH or OCH_3; and pharmaceutically acceptable salts thereof.

7. A pharmaceutical composition in unit dosage form having analgesic activity which comprises a safe and effective amount of a compound of formula:



wherein X is



wherein R is C_3–C_{12} alkyl or aralkyl, branched or unbranched, unsubstituted aryl, haloaryl, or C_3–C_{22} alkenyl, branched or unbranched, wherein R_1 is H, OH or OCH_3, and wherein R_2 is H or OH, at least one of R_1 and R_2 being OH or OCH_3, or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

25. A method for preventing or reducing the dermal irritation caused by a thioglycolate depilatory agent, which comprises the step of applying to at least a portion of a depilated area a compound or salt according to claim **1** in an amount effective to prevent or reduce irritation caused by treatment of the depilated area with a thioglycolate depilatory agent.

4,401,664

CREAM BASE COMPOSITION

Ingeborg Scheuffgen, Neuss, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 328,995

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131006

Int. Cl.³ A61K *47/00*

U.S. Cl. 424—365 1 Claim

1. A cream base composition consisting of:

(a) about 70% by weight of glycerin mono-distearate,

(b) about 10% by weight of cetyl/stearyl alcohol,

(c) about 10% by weight of cetyl palmitate, and

(d) about 10% by weight of the triglyceride of a C_{12}–C_{18} fatty acid,

based upon the total weight of the cream base composition.

4,401,665

SLEEP-AID COMPOSITION CONTAINING AN ANALGESIC AND DIPHENHYDRAMINE DIHYDROGENCITRATE, AND METHOD OF USE

Harold Sheinaus, Watchung, and Arnold D. Marcus, Livingston, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 14, 1981, Ser. No. 254,036

Int. Cl.³ A61K *31/165, 31/615*

U.S. Cl. 424—233 19 Claims

1. An analgesic and sleep-aid composition in unit dosage form containing an analgesic component comprising aspirin, acetaminophen or a combination of the two; said composition also containing a pharmacologically effective amount of diphenhydramine dihydrogencitrate, said aspirin, acetaminophen or combination of the two being present in analgesically effective amounts; said analgesic component being present in said unit dosage form in the amount of from about 80 mg. to about 1000 mg.; and said diphenhydramine dihydrogencitrate being present in said unit dosage form in the range of from about 19 mg. to about 77 mg.

4,401,666

USE OF METALLIC SALTS OF PYRIDINE-2-THIONE-N-OXIDE TO TREAT OR PREVENT BOVINE MASTITIS

John H. Wedig, Guilford, Conn.; John G. Babish, Ithaca, N.Y., and Jeffrey Davidson, Tulare, Calif., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 1, 1982, Ser. No. 344,666

Int. Cl.³ A61K *31/555, 31/44*

U.S. Cl. 424—245 8 Claims

1. A method of treating an animal for bovine mastitis which comprises administering to said animal an effective amount of at least one metallic salt of pyridine-2-thione-N-oxide to treat or prevent bovine mastitis.

4,401,667

CEPHALOSPORINS

Bernd Wetzel; Eberhard Woitun, both of Biberach; Wolfgang Reuter, Laupertshausen; Roland Maier, Biberach; Uwe Lechner, Ummendorf, and Hanns Goeth, Biberach, all of Fed. Rep. of Germany, assignors to Karl Thomae Gesellschaft mit beschränkter Haftung, Ingelheim am Rhein, Fed. Rep. of Germany

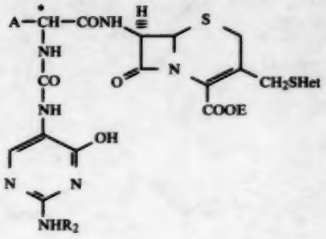
Filed Nov. 20, 1981, Ser. No. 323,432

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047082

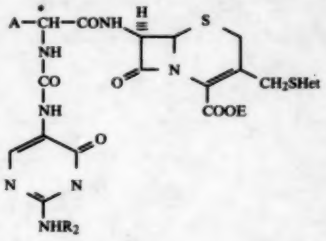
Int. Cl.³ A61K *31/545;* C07D *501/56*

U.S. Cl. 424—246 11 Claims

1. A compound of the formula



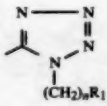
or



wherein

A is phenyl, 4-hydroxy-phenyl, 2-thienyl, 3-thienyl or 3,4-dihydroxy-phenyl;

Het is 4H-5,6-dioxo-1,2,4-triazin-3-yl, 4-methyl-5,6-dioxo-1,2,4-triazin-3-yl, 1-vinyl-tetrazol-5-yl, 1-allyl-tetrazol-5-yl or



where

n is an integer from 1 to 3, inclusive,

R_1 is hydroxyl, amino, dimethylamino, acetylamino, aminocarbonyl, aminocarbonylamino, aminosulfonyl, aminosulfonylamino, methylcarbonyl, methylsulfonylamino, cyano, hydroxysulfonylamino, methylsulfonyl, methylsulfinyl, a carboxylic acid group or a sulfonic acid group, or $-(CH_2)_n-R_1$ may also be alkyl of 2 to 4 carbon atoms or 2,3-dihydroxy-propyl;

R_2 is an unsubstituted or monosubstituted heterocyclic radical selected from the group consisting of 3-pyridyl, 5-pyrimidinyl, 2-thienyl, 2-furylmethyl, 2-thienylmethyl, 2-imidazolylmethyl, 2-thiazolylmethyl, 3-pyridylmethyl or 5-pyrimidinylmethyl, where the substituent is chlorine, methyl, acetylamino, hydroxyl, methylsulfinyl, methylsulfonyl, aminocarbonyl or aminosulfonyl; and

E is hydrogen or a protective group which is easily removable in vitro or in vivo;

or, when E is hydrogen, a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

10. An antibiotic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antibiotic amount of a compound of claim 1.

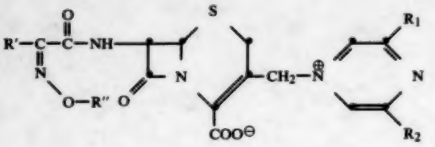
4,401,668

PYRAZINIUM SUBSTITUTED CEPHALOSPORINS

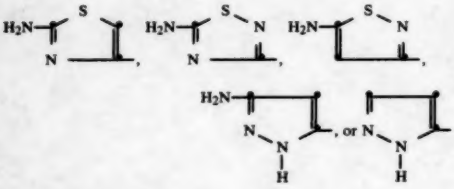
William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 2, 1981, Ser. No. 307,984
Int. Cl.³ A61K *31/545*; C07D *501/46*
U.S. Cl. 424—246 19 Claims

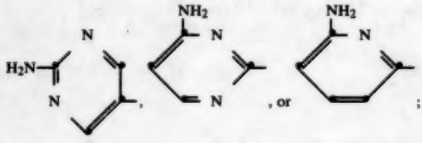
1. A compound of the formula



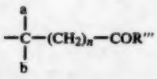
wherein R′ is a 5-membered heterocyclic ring of the formulas



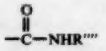
or a 6-membered heterocyclic ring of the formulas



R″ is hydrogen, C_1–C_4 alkyl, a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group of the formula



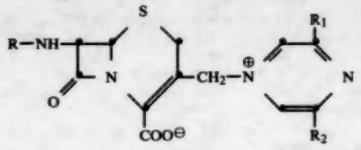
wherein a and b independently are hydrogen or C_1–C_3 alkyl, and a and b when taken together with the carbon atom to which they are attached form a C_3–C_7-membered carbocyclic ring, n is 0–3, and R‴ is hydroxy, C_1–C_4 alkoxy, or amino; or R″ is a carbamoyl group of the formula



wherein R⁗ is hydrogen, C_1–C_4 alkyl, phenyl, or phenyl substituted C_1–C_3 alkyl; R_1 is amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, C_1–C_4 hydroxyalkylamino, or di(C_1–C_4 hydroxyalkyl)amino; R_2 is hydrogen or C_1–C_4 alkyl; and the pharmaceutically acceptable non-toxic salts thereof.

13. The antibiotic formulation comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable diluent.

19. A compound of the formula



wherein R is formyl; R_1 is amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, C_1–C_4 hydroxyalkylamino, or di(C_1–C_4 hydroxyalkyl)amino; and R_2 is hydrogen or C_1–C_4 alkyl; and the acid addition salts thereof.

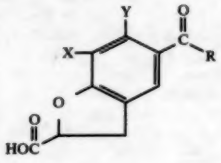
4,401,669

2,3-DIHYDRO-SUBSTITUTED-5-BENZOYL BENZOFURAN-2-CARBOXYLIC ACIDS AND THEIR USE IN TREATING HYPERTENSION

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

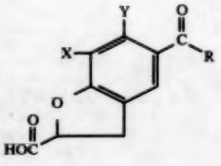
Division of Ser. No. 873,024, Jan. 27, 1978, Pat. No. 4,296,122, which is a division of Ser. No. 678,529, Apr. 20, 1976, Pat. No. 4,086,542, which is a continuation-in-part of Ser. No. 594,839, Jul. 9, 1976, abandoned. This application Oct. 14, 1981, Ser. No. 311,477
Int. Cl.³ A61K *31/34*; C07D *307/85*
U.S. Cl. 424—248.54 13 Claims

1. A compound having the formula:



wherein
X is halo, methyl or hydrogen;
Y is halo or methyl and
X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;
R is benzyl or mono or di nuclear substituted benzyl wherein the substituent is halo, methyl, methoxy or trifluoromethyl, and
the non-toxic pharmaceutically acceptable salt, lower alkyl ester, unsubstituted, mono-lower alkyl, di-lower alkyl, piperidine and morpholine amide derivative thereof.

11. A method of treatment of edema associated with hypertension comprising the administration of a therapeutically effective amount in unitary dosage form of a compound having the formula of:



wherein
X is halo, methyl or hydrogen;
Y is halo or methyl;
X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;
R is benzyl or mono or di nuclear substituted benzyl wherein

the substituent is halo, methyl, methoxy or trifluoromethyl; and

the non-toxic pharmaceutically acceptable salt, lower alkyl ester, unsubstituted, mono-lower alkyl, di-lower alkyl, piperidine and morpholine amide derivative thereof.

4,401,670

METHOD FOR TREATING GONORRHEA INFECTIONS WITH 2-ACETYL- AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES

Daniel L. Klayman, Chevy Chase; John P. Scovill, Rockville; Joseph F. Bartosevich; Carl J. Mason, both of Silver Spring, all of Md., and T. Scott Griffin, Orange, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

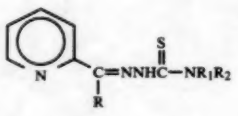
Continuation of Ser. No. 4,247, Jan. 4, 1979, Pat. No. 4,317,776. This application Oct. 14, 1981, Ser. No. 311,370

Int. Cl.³ A61K *27/00, 31/495, 31/435, 31/445*

U.S. Cl. 424—250 46 Claims

1. A method for treating an animal which has gonorrhea by administering to said animal a therapeutically-effective amount of:

(a) a pyridine thiosemicarbazone derivative selected from the compounds represented by the formula:



or,

(b) a pharmaceutically-acceptable acid addition salt thereof wherein

R is methyl or ethyl; and

R_1 is alkyl having 1 to 12 carbon atoms cycloalkyl having 3 to 10 carbon atoms; substituted alkyl (wherein the substituent is amino, alkylamino, dialkylamino, cycloalkyl, hydroxy, COO alkyl, phenyl, or pyridyl); alkenyl having 2 to 6 carbon atoms; alkynyl having 3 to 6 carbon atoms; substituted benzyl (wherein the substituent is methyl or phenyl on the alpha carbon atom, or the substituent is alkyl, dialkyl, halo, dihalo, or alkoxy on the phenyl ring); adamantyl; phenyl; naphthyl; substituted phenyl or substituted naphtyl (wherein the ring is mono-, di-, or trisubstituted and the substituents are alkyl, halo, alkoxy, hydroxy, phenoxy, trifluoromethyl, dialkylamino, dialkylaminoalkyl, or COO alkyl); and

R_2 is hydrogen or is selected from the group of radicals listed above for R_1, in which case R_1 and R_2 may be the same of different; or

(1) alkylenimino of 3 to 13 carbon atoms;

(2) alkylenimino of 3 to 13 carbon atoms which may have one double bond and/or is mono- or disubstituted with alkyl, hydroxy, phenyl, or benzyl;

(3) alkylenimino of 3 to 13 carbon atoms which is either bridged by an alkylene group, or is fused to a phenyl ring; or is attached by a spiro linkage to an ethylene ketal group;

(4) homopiperazinyl; homopiperazinyl substituted with alkyl; piperazinyl; or piperazinyl substituted with alkyl, dialkyl, phenyl, COO alkyl, trifluoromethylphenyl, halophenyl, benzyl, or pyridyl;

provided that when R_2 is hydrogen, then R_1 cannot be ethyl, isopropyl, or monochlorophenyl.

4,401,671

TREATMENT OF GIARDIASIS AND TRICHOMONIASIS

Ching C. Wang, San Francisco, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 10, 1982, Ser. No. 347,655

Int. Cl.³ A61K *31/505, 31/495*

U.S. Cl. 424—251 1 Claim

1. A method of treating giardiasis in humans which comprises the administration to a person in need of such treatment of an effective antigiardiasis amount of 5-fluoro-2,4-(1H, 3H) pyrimidinedione.

4,401,672

NON-ADDICTIVE NARCOTIC ANTITUSSIVE PREPARATION

Philip S. Portoghese, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 13, 1981, Ser. No. 310,522

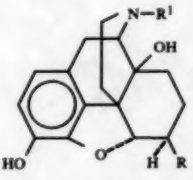
Int. Cl.³ A61K *31/485*

U.S. Cl. 424—260 5 Claims

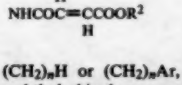
1. A non-addictive narcotic antitussive preparation comprising:

(A) a normally addictive narcotic analgesic cough suppressive agent selected from the group consisting of codeine, hydrocodone, hydromorphone, pholcodeine, ethylmorphine, methadone and dihydrocodiene;

(B) a highly selective long-acting opioid receptor site-directed narcotic antagonist alkylating agent having the formula:



Wherein R is acetylacrylamide, acrylamide, or α-haloacrylamide wherein the halogen is chlorine, iodine or bromine, a haloacetamide: NHCO—CH_2X wherein X is iodine, chlorine or bromine, isothiocyanate and esters, said esters having the general formula:



wherein R^2 is $(CH_2)_nH$ or $(CH_2)_nAr$, wherein Ar is phenyl, furane, naphthyl, thiophene or substituted phenyl wherein the substituent is halogen, hydroxy, nitro, methoxy, methyl, trifluoromethyl or amino, and n is 1 to 5; and R′ is cyclo-propylmethyl, allyl and substituted allyl, the substituent of which is methyl, ethyl, propyl or halogen; and pharmaceutically acceptable salts thereof; and

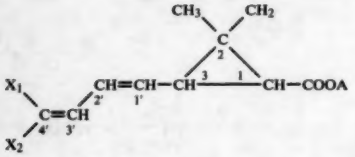
(C) a pharmaceutically acceptable liquid carrier, the antagonist alkylating agent being present in amount from about 1 to 50% w/w of the narcotic cough suppressive agent, and the antagonist/narcotic mixture being present in the carrier in amount between about 0.03 to 5% w/v.

4,401,673
PESTICIDAL 3-(BUTA-1',3'-DIENYL)-CYCLOPROPANE-1-CARBOXYLIC ACID ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Pierre Girault, Paris, all of France, assignors to Roussel Uclaf, Paris, France

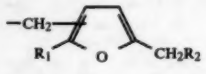
Filed Jan. 26, 1981, Ser. No. 228,454
Claims priority, application France, Jan. 25, 1980, 80 01640
Int. Cl.³ A01N *53/00;* **C07D** *213/57;* **C07C** *69/743, 121/75*
U.S. Cl. 424—263 **16 Claims**

1. A compound selected from the group consisting of 3-(buta-1',3'-dienyl)-cyclopropane-1-carboxylic acid compounds of all the possible stereoisomers or mixtures of stereoisomers of compounds of the formula

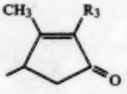


I

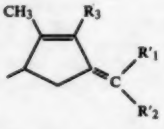
wherein X_1 and X_2 are individually a halogen and A is selected from the group consisting of (A) benzyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkadienyl of 4 to 8 carbon atoms, methylenedioxy, benzyl and halogen, (B)



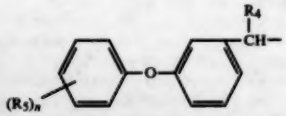
wherein R_1 is selected from the group consisting of hydrogen and $-CH_3$ and R_2 is selected from the group consisting of monocyclic aryl and $-CH_2-C\equiv CH$, (C)



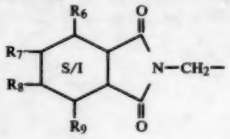
wherein R_3 is an aliphatic of 2 to 6 carbon atoms containing at least one carbon-carbon unsaturation, (D)



wherein R_1' and R_2' are individually selected from the group consisting of hydrogen, halogen, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms and cyano and R_3 has the above definition, (E)



wherein R_4 is selected from the group consisting of hydrogen, —CN, $-CH_3$, $-CONH_2$, $-CSNH_2$ and $-C\equiv CH$, R_5 is selected from the group consisting of chlorine and $-CH_3$ and n is 0,1 or 2, (F) α-cyano-3-phenoxy-benzyl, (G) α-cyano-3-pyridiny-benzyl and (H)



wherein R_6, R_7, R_8 and R_9 are individually selected from the group consisting of hydrogen, chlorine, and $-CH_3$ and S/I indicates the ring may be aromatic or dihydro or tetrahydro.

12. A method of combatting insects comprising contacting insects with an insecticidally effective amount of at least one compound of claim 1.

4,401,674
INTRAMAMMARY COMPOSITIONS

John S. Dowrick, Littlehampton, England, assignor to Beecham Group Limited, United Kingdom

Continuation of Ser. No. 88,858, Oct. 29, 1979, abandoned. This application Dec. 24, 1981, Ser. No. 334,437
Claims priority, application United Kingdom, Oct. 27, 1978, 42337/78
Int. Cl.³ A61K *31/43*
U.S. Cl. 424—271 **14 Claims**

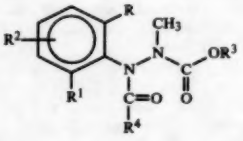
8. A method of treating mammary disorders in animals which comprises the intramammary administration of a therapeutically effective amount of a suspension in an oily veterinarily acceptable vehicle of from 0.1% to 40% by weight of a moisture sensitive penicillin calculated as free acid and from 5% to 20% by weight of calcium alumino-silicate molecular sieve powder.

4,401,675
FUNGICIDAL CARBAZATES

Luigi Garlaschelli, Pavia; Franco Gozzo, San Donato Milanese, and Luigi Mirenna, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 2, 1981, Ser. No. 308,137
Claims priority, application Italy, Oct. 3, 1980, 25100 A/80
Int. Cl.³ A01N *43/08;* **C07C** *125/073*
U.S. Cl. 424—285 **13 Claims**

1. Compounds of general formula



(I)

in which

R, R^1 and R^2 (like or unlike one another) are H, a halogen, an alkyl C_1–C_4, an alkoxyl C_1–C_4;

R^3 is an alkyl C_1–C_4;

R^4 is an alkyl C_1–C_4 optionally substituted by one or more halogen atoms or alkoxyls C_1–C_4; a phenyl optionally substituted by one or more halogen atoms, alkyl groups C_1–C_4 or alkoxyl groups C_1–C_4; a benzyl; the group CH_2COCH_3; or furyl.

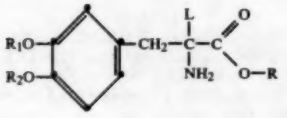
13. A fungicidal formulation containing, as active substance, a fungicidally effective amount of at least one compound according to claim 1, and an inert carrier.

4,401,676
NOVEL α-AMINO ACIDS

Arthur A. Patchett, Cranford, and David Taub, Metuchen, both of N.J., assignors to Merck & Co., Inc., N.J.

Filed Jun. 1, 1977, Ser. No. 802,390
Int. Cl.³ A61K *31/245*; C07C *101/72*
U.S. Cl. 424—309 **22 Claims**

1. Compounds having the formula



wherein

L is —C≡CH or —CH=CH_2,

R_1 and R_2 are independently selected from H and C_1–C_6 alkanoyl, and

R is C_1–C_{18} alkyl or H.

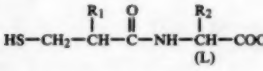
20. An antihypertensive pharmaceutical composition containing a therapeutical effective amount of a compound of claim **1** or a pharmaceutically acceptable salt thereof and a pharmaceutical carrier therefor.

4,401,677
ENKEPHALINASE INHIBITORS

Roland Greenberg, Princeton; David W. Cushman, West Windsor, both of N.J.; B. Richard Vogt, Yardley, Pa.; Frank L. Weisenborn, Titusville, and Michael J. Antonaccio, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 9, 1981, Ser. No. 310,192
Int. Cl.³ A61Y *31/19*
U.S. Cl. 424—317 **11 Claims**

1. A method of inhibiting the degradation of enkephalins by the enkephalinase enzyme in a mammalian host which comprises administering to said mammal an enkephalinase inhibiting effective amount of the enkephalinase inhibitor of the formula

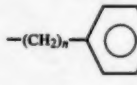


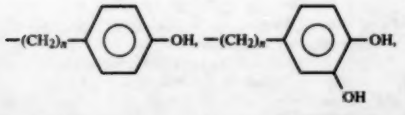
(L)

or a pharmaceutically acceptable salt thereof wherein:

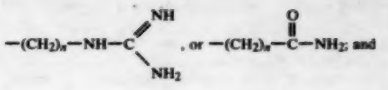
R_1 is straight or branched chain alkyl of 1 to 4 carbons, benzyl or phenethyl;

R_2 is straight or branched chain alkyl of 1 to 4 carbons,





$-(CH_2)_n-NH_2$, $-(CH_2)_n-SH$, $-(CH_2)_n-S$-lower alkyl wherein lower alkyl is straight or branched chain of 1 to 4 carbons,



and

n is an integer from 1 to 4.

4,401,678
PRODUCTION OF WINE

Ronald E. Beaumont, Delta, Canada, assignor to Jordan & Ste-Michelle Cellars Ltd., St. Catharines, Canada

Filed Nov. 10, 1981, Ser. No. 319,973
Int. Cl.³ C12G *1/00*
U.S. Cl. 426—15 **8 Claims**

1. In a process for the production of wine from grapes which produce a highly flavored wine having a high Labrusca Flavor index wherein grape juice is formed from the grapes and wine is formed from the grape juice by fermentation, the improvement which comprises:

effecting ultrafiltration of said grape juice using a semi-permeable membrane having a molecular weight cut-off of from 175 to 200 so as to permit at least a substantial proportion of low molecular weight volatile esters having a molecular weight lower than 175 to 200 to pass therethrough as a filtrate while retaining essentially all sugars and colorants in the grape juice having a molecular weight greater than 175 to 200 as a grape juice retentate, and

adding water to the grape juice retentate during said ultrafiltration at a flow rate which is essentially the same as the flow rate of filtrate through the membrane until about 25 to about 75% of the initial volume of the grape juice passes through the membrane to produce a grape juice retentate having essentially the same volume and containing essentially the same amount of sugar as said grape juice before ultrafiltration, whereby wine produced from said grape juice retentate has a decreased flavor and a lowered Labrusca Flavor Index.

2. A process for the treatment of wine produced by fermentation from grapes which produce a highly flavored wine having a high Labrusca Flavor Index, which comprises:

effecting ultrafiltration of said wine using a semi-permeable membrane having a molecular weight cut-off of from 175 to 200 so as to permit at least a substantial proportion of low molecular weight volatile esters having a molecular weight less than 175 to 200 to pass therethrough as a filtrate while retaining in the wine essentially all colorants and sugars having a molecular weight greater than the 175 to 200 as a wine retentate, and

concentrating the wine during the ultrafiltration to a volume of about 25 to about 75% of the initial volume of the wine by allowing about 25% to about 75% of the initial wine volume to pass through the membrane, thereby to produce as the wine retentate, a concentrated wine having essentially the same alcohol content as the wine before ultrafiltration, an intensified color and a lowered Labrusca Flavor Index.

4,401,679
PROCESS FOR PREPARING CHEESE-BASE

Jan Rubin, and Poul Bjerre, both of Silkeborg, Denmark, assignors to Pasilac A/S, Silkeborg, Denmark

Filed Aug. 6, 1981, Ser. No. 290,717
Claims priority, application United Kingdom, Jul. 17, 1981, 8122195
Int. Cl.³ A23C *19/02, 19/028, 19/045*
U.S. Cl. 426—36 **6 Claims**

1. A process for preparing cheese-base of improved storage and curing characteristics from milk which comprises the steps of:

(a) concentrating the milk by ultrafiltration combined with diafiltration to produce a retentate of reduced lactose content;
(b) inoculating the retentate from the concentration step by the addition of an acid culture;
(c) evaporating the inoculated retentate to a desired dry-matter percentage;
(d) packing as a prepared product and acidifying the packed and prepared product to produce the cheese-base.

4,401,680

BIOCONVERSION OF CEREAL GRAIN STRAWS TO PROTEIN-ENRICHED PRODUCT

Murray M. Young, Waterloo, Canada, assignor to University of Waterloo, Waterloo, Canada

Continuation-in-part of Ser. No. 3,998, Jan. 17, 1979, abandoned. This application Mar. 4, 1981, Ser. No. 240,586
Int. Cl.³ A23K *1/00*
U.S. Cl. 426—53 **11 Claims**

1. A process for forming a proteinaceous material from cereal grain straw, which consists of:
(a) pretreating said cereal grain straw in particulated form with an aqueous sodium hydroxide solution at a concentration of about 0.25 to about 1.0% W/V NaOH at a temperature of about 60° to 121° C. for a time from about 120 to about 15 minutes sufficient to sterilize said straw and form a slurry of the heated straw and spent sodium hydroxide solution;
(b) mixing said slurry with a non-carbon fermentation nutrient chemical solution to form a sterile fermentation medium having a solids concentration of up to about 30% W/W;
(c) aerobically fermenting said pretreated straw of step (a) in said fermentation medium of step (b) by the fungus, *Chaetomium cellulolyticum,* at a pH of about 5 to about 7 at a temperature of about 30° to about 40° C. for a time sufficient to provide a fermented solid mass consisting of about 20 to about 80% DM of the fungus and the balance of unfermented cellulosic material; and
(d) separating said solid mass from the fermentation medium.

4,401,681

TWO-PHASE FOOD PRODUCTS WITH REDUCED INTER-PHASE MOISTURE TRANSFER

Leland K. Dahle, Cherry Hill, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Sep. 22, 1981, Ser. No. 304,356
Int. Cl.³ A21D *13/00*
U.S. Cl. 426—94 **15 Claims**

1. A process for preventing the migration of fluid from a high moisture phase to a low moisture phase of a dough-based composite food product, said process comprising the steps of taking said composite having a high moisture phase containing at least 5% dextrin and at least 1% of another hydrophilic polysaccharide gelling agent; and dehydrating said high moisture phase for a period of time sufficient to provide a barrier film of substantially reduced moisture permeability of the interface between said low moisture phase and said high moisture phase.

4,401,682

EXPANDABLE LOW CALORIE COMPOSITIONS

Orlando A. Battista, 5280 Trail Lake Dr., Fort Worth, Tex. 76133

Filed Jul. 31, 1981, Ser. No. 256,022
Int. Cl.³ A23J *3/00;* A23L *1/34*
U.S. Cl. 426—285 **9 Claims**

1. A method for the preparation of a low calorie edible product adapted to expand to a swollen gelatinous mass at least 3 times its original volume when ingested and comes into contact with the gastric juice of the stomach which comprises forming an aqueous solution of animal or vegetable protein, adding to the solution an edible crosslinking agent sufficient to cross-link said protein, aerating the solution subjected to cross-linking, cooling the aerated solution to form a gel, drying the gel to a moisture content of less than about 10%, comminuting the dried gel to form finely divided, particulate, aerated protein; dry blending the particulate, aerated protein with particulate edible cellulose, the particulate, aerated protein constituting from about 10 to 50%, by weight of the blend and compressing the blend into a shaped form.

4,401,683

CARBOHYDRATE FOOD PRODUCTS RESISTANT TO *CLOSTRIDIUM BOTULINUM* AND THE FORMATION OF ENTEROTOXIN

John S. Thompson, Wayne, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jul. 6, 1981, Ser. No. 280,188
Int. Cl.³ A23B *7/10, 9/00;* A23L *1/08, 1/09*
U.S. Cl. 426—331 **13 Claims**

1. A carbohydrate food product, resistant to the outgrowth of *Clostridium botulinum* and the formation of enterotoxin, containing an amount of a compound, selected from the group consisting of hypophosphorous acid and its nontoxic water-soluble salts, effective to inhibit growth of *Clostridium botulinum* and formation of enterotoxin in said food product.

4,401,684

PRESERVATION OF HOPS UTILIZING ASCORBIC ACID

Jan P. Versluys, Bridport, Australia, assignor to Australian Hop Marketers Pty. Ltd., Hobart, Australia

Filed Oct. 1, 1981, Ser. No. 307,699
Int. Cl.³ C12C *3/04*
U.S. Cl. 426—546 **7 Claims**

1. A method of preventing the deterioration of hops, said method characterized by the step of adding ascorbic acid to the hops, said acid being in an amount sufficient to prevent deterioration of hops by oxidation.

4,401,685

COLD WATER SOLUBLE GELATIN AND PROCESS

Gary M. Brown, Danbury; Peter M. Bosco, and Robert L. Danielson, both of Brookfield Center, all of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 22, 1982, Ser. No. 350,557
Int. Cl.³ A23L *1/04*
U.S. Cl. 426—576 **18 Claims**

1. A process for preparing a cold water soluble gelatin product, comprising: applying to a surface a thin layer of an aqueous solution comprising gelatin, sugar comprising a major amount of a combination of corn syrup solids having a DE of 42 or less and maltodextrin, the ratio of sugar to gelatin being in the range of from about 3:1 to about 7:1, acid and a surface active agent in an amount effective to increase dispersibility; drying the solution by heating the surface with steam at a pressure of from about 10 to about 60 psig while maintaining the solution under an absolute pressure of less than about 5 inches of mercury; and removing the resulting dried material from the surface.

4,401,686

PRINTED CIRCUIT AND METHOD OF FORMING SAME

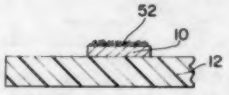
David Durand, Portsmouth, R.I., assignor to Raymond Iannetta, Greenville, R.I., a part interest

Filed Feb. 8, 1982, Ser. No. 346,941
Int. Cl.³ H05K *3/12, 3/14*
U.S. Cl. 427—13 **16 Claims**

1. A method of forming an electrically conductive circuit on a translucent substrate comprising the sequential steps of:
a. applying an ultraviolet reactive ink to said substrate in substantially the desired image of said circuit;

b. partially curing said ink to an elastic state by exposing it to ultraviolet radiation;

c. depositing electrically conductive metallic particles on said ink; and



d. finally curing said ink to a hardened state by exposing it to ultraviolet radiation.

4,401,687

PLASMA DEPOSITION OF SILICON

Richard S. Rosler, Paradise Valley, and George M. Engle, Scottsdale, both of Ariz., assignors to Advanced Semiconductor Materials America, Phoenix, Ariz.

Filed Nov. 12, 1981, Ser. No. 320,451

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—38 **11 Claims**

1. In a method for the plasma vapor deposition of a silicon-comprising film, the steps of:

introducing halogenated gas in sufficient amount into said vapor to increase the rate of plasma-induced vapor deposition relative to thermally induced vapor deposition; and

maintaining said gas and said vapor at a temperature in a range of 600° C. to 1200° C.

4,401,688

IMPARTING PERMANENT PRESS CHARACTERISTICS

John L. Garnett, Longueville; Thomas Schwarz, Rose Bay, and Grant Fletcher, Maroubra, all of Australia, assignors to Unisearch Limited (N.S.W.)Australia, Kensington, Australia

Continuation of Ser. No. 74,120, Sep. 10, 1979, abandoned. This application Apr. 8, 1981, Ser. No. 252,132

Claims priority, application Australia, Sep. 11, 1978, PD5888

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—43.1 **9 Claims**

1. A method for imparting permanent press characteristics to textile articles without using textile resins and textile resin catalysts comprising the steps of:

(a) applying to the textile article, at least in the area to be creased and pressed, a urethane acrylate prepolymer or an epoxy acrylate prepolymer or an acrylated polyester prepolymer;

(b) curing the prepolymer in situ on the textile article using ultraviolet radiation or an electron beam; and

(c) pressing the textile article along a crease after the application of the prepolymer and after the curing of the prepolymer.

4,401,689

RADIATION HEATED REACTOR PROCESS FOR CHEMICAL VAPOR DEPOSITION ON SUBSTRATES

Vladimir S. Ban, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 117,236, Jan. 31, 1980, Pat. No. 4,263,872. This application Oct. 28, 1980, Ser. No. 201,437

Int. Cl.³ B05D *3/02, 3/14*

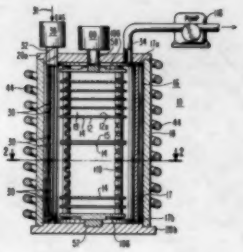
U.S. Cl. 427—45.1 **5 Claims**

1. In a method of chemically vapor-depositing a material onto the surfaces of a plurality of substrates within a reaction chamber wherein said substrates are heated while contacting said surfaces with a gaseous compound of said material to be deposited, comprising the steps of:

positioning a tubular structure within said chamber to contain said substrates, said tubular structure having a wall formed of susceptor material selected from the group of susceptor materials consisting essentially of graphite and silicon carbide, said tubular structure of susceptor material serving as a radiant source of heat when heated to heat said substrates;

said susceptor material having the property of being inductively heated when exposed to radio frequency energy,

supporting said substrates within said tubular structure in a



stack-like arrangement wherein said surfaces are substantially parallel to each other;

directing a flow of gas to the surfaces of said substrates through a slitted opening in said tubular structure, and

inductively heating said tubular structure by radio frequency energy to heat said substrates by radiant heat from said radio frequency heated tubular structure.

4,401,690

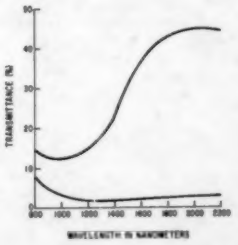
THERMOCHROMIC VANADIUM OXIDE WITH DEPRESSED SWITCHING TEMPERATURE

Charles B. Greenberg, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1982, Ser. No. 344,906

Int. Cl.³ B05D *5/12, 3/02;* C03C *17/245*

U.S. Cl. 427—87 **5 Claims**



1. In a method for making a thermochromic window comprising the steps of contacting a surface of a glass substrate with a vanadium compound and heating the glass substrate to a sufficient temperature to obtain a vanadium oxide film comprising VO_2, the improvement which comprises doping said film with a compound which depresses the switching temperature of VO_2.

4,401,691

OXIDATION OF SILICON WAFERS TO ELIMINATE WHITE RIBBON

William C. Young, Dallas, Tex., assignor to Burroughs Corporation, Detroit, Mich.

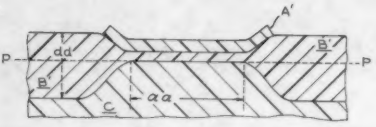
Filed Dec. 18, 1978, Ser. No. 970,580

Int. Cl.³ H01L *21/316*

U.S. Cl. 427—93 **18 Claims**

1. In an improved technique for forming silicon oxide films

with a prescribed wet oxidizing medium at a prescribed processing temperature upon a substrate, this substrate including a silicon constituent and SiO_2 film portions thereon, this technique being susceptible to formation of nitrogen interface compounds at the interface of said substrate and the overlying SiO_2 layer, a cation portion of said interface compounds being apt for combination with prescribed anionic material to form a



prescribed vapor product at said processing temperature, the improvement step comprising: adding sufficient of at least one additive reagent including

said anionic material to so combine with said cationic material and form said vapor compound at said processing temperature whereby to eliminate formation of said interface-compounds and to facilitate the dissipation of said vapor compound product.

4,401,692

TRANSFER-PRINTING SUPPORT

Rudolf Schickfluss, Kelkheim; Manfred Schneider, Eppstein, and Claus Schuster, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

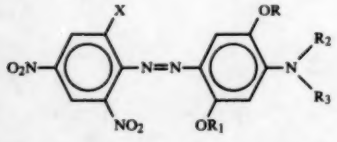
Filed Jul. 31, 1981, Ser. No. 288,694

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1980, 3029475

Int. Cl.³ B41M *5/18, 5/20;* **C09B** *29/06, 29/08*

U.S. Cl. 8—471 **13 Claims**

1. A transfer printing support consisting essentially of a sheet-like structure of metal or natural or regenerated cellulosic material imprinted or impregnated with a dyestuff formulation containing a black dyestuff mixture consisting essentially of at least 50% by weight, relative to the total weight of dyestuffs, of a readily sublimable blue disperse dyestuff of the formula



in which X represents hydrogen or halogen, R, R_1 and R_2 each represents alkyl having 1–4 carbon atoms and R_3 represents hydrogen or alkyl having 1–4 carbon atoms, and not more than 50% by weight of

(a) at least one orange disperse dyestuff selected from the group consisting of C.I. Disperse Orange 1, C.I. Disperse Orange 3, C.I. Disperse Orange 7 and C.I. Disperse Orange 25, or

(b) a mixture of at least one yellow disperse dyestuff selected from the group consisting of C.I. Disperse Yellow 3, C.I. Disperse Yellow 13, C.I. Disperse Yellow 16, C.I. Disperse Yellow 23, C.I. Disperse Yellow 27, C.I. Disperse Yellow 54, C.I. Disperse Yellow 60, C.I. Disperse Yellow 64 and C.I. Disperse Yellow 119, and at least one red disperse dyestuff selected from the group consisting of C.I. Disperse Red 1, C.I. Disperse Red 4, C.I. Disperse Red 11, C.I. Disperse Red 13, C.I. Disperse Red 15, C.I. Disperse Red 60, C.I. Disperse Red 65 and C.I. Disperse Red 280, or

(c) a mixture of at least one of said orange disperse dyestuffs and at least one of said yellow disperse dyestuffs.

4,401,693

METHOD OF MANUFACTURING A HEAT-REFLECTING FILTER

Günter Frank; Heiner Köstlin, both of Aachen, Fed. Rep. of Germany; Leo M. Sprengers, Grobbendonk, Belgium, and Ronald J. Campbell, Pennington, N.J., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,963

Int. Cl.³ G02B *1/10, 5/08, 5/26*

U.S. Cl. 427—160 **5 Claims**

1. A method of manufacturing a heat-reflecting filter, especially for light sources having a large share of infrared, in which a tin-doped layer of indium oxide is provided on a light-pervious carrier and during or after the coating the carrier is heated at a temperature between 300° C. and the softening temperature of the carrier in a reducing atmosphere, characterized in that the indium oxide layer is doped with less than 7 mol % of tin calculated on the quantity of indium oxide and that for the reduction a gas mixture consisting of 5 to 20% by volume of hydrogen with nitrogen as remainder to 100 vol.%, with the addition of 0.5 to 3% oxygen or 2.5 to 15% air, each time calculated on the hydrogen share, is passed over the filter layer for from 10 minutes to 2 hours, which layer is present on a carrier heated at a temperature between 350° and 400° C.

4,401,694

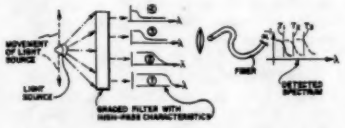
METHOD AND APPARATUS FOR AN OPTICAL SENSOR UTILIZING SEMICONDUCTOR FILTERS

William H. Quick, La Habra Heights; Kenneth A. James, Corona Del Mar, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 5,532, Jan. 22, 1979, abandoned. This application Apr. 3, 1980, Ser. No. 137,069

Int. Cl.³ B05D *5/06*

U.S. Cl. 427—162 **4 Claims**



1. A method for fabricating a sensor for use in an optical sensor system that utilizes a position variable light beam for sensing the status of a physical parameter and a transmission means for reporting the status to a detector, the method comprising the steps of:

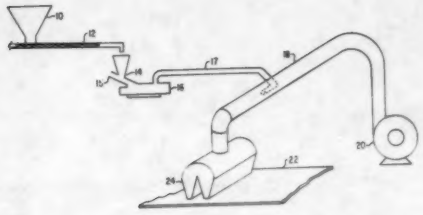
1. selecting a semiconductor material having optical wavelength cutoff characteristics at the edge of the absorption band, which vary with annealing temperature,
2. annealing a region of said semiconductor material at a selected annealing temperature,
3. repeating step 2 hereof for additional regions of semiconductor material and modifying the annealing temperature for each such additional region relative to the annealing temperature of the previous region, and
4. selecting an annealing temperature for each said region to provide a contiguous composite of such regions which, in combination, provide an optical filter having a wavelength cutoff characteristic that varies with position of said light beam relative to said filter.

4,401,695

METHOD OF AND APPARATUS FOR APPLYING POWDER COATING REACTANTS

John F. Sopko, Trafford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 1, 1982, Ser. No. 383,644
Int. Cl.³ B05D 1/12
U.S. Cl. 427—180 8 Claims



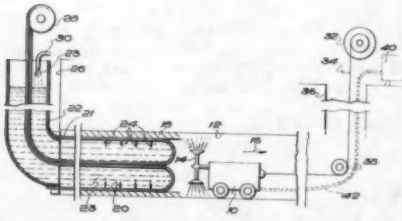
1. In a method for coating a substrate with a film by contacting a surface of the substrate with a powder coating reactant comprising the steps of dispersing said powder coating reactant in a carrier gas stream; creating turbulence in said stream; and delivering the powder coating reactant/carrier gas mixture to the surface to be coated, the improvement which comprises dispersing said powder coating reactant in a carrier gas which is supplied at a rate of at least about 100 cubic feet per minute and at a pressure not greater than one pound per square inch.

4,401,696

LINING OF PIPELINES AND PASSAGEWAYS

Eric Wood, Wellingborough, England, assignor to Insituform International, Inc., Monrovia, Liberia

Filed Sep. 30, 1981, Ser. No. 307,102
Int. Cl.³ B05D 7/22, 1/02, 3/12
U.S. Cl. 427—236 7 Claims



1. A method for lining a pipeline or passageway, such as an underground sewer, which includes the steps of:

(a) spraying a hardenable thixotropic cementitious material radially outwardly and progressively along the interior of the pipeline or passageway until a lining of the desired thickness has been built up on the interior surface of the pipeline or passageway;

(b) everting a flexible tubular membrane into said pipeline or passageway and progressively along the interior of said pipeline closely behind said newly applied cementitious material before said sprayed cementitious material has had an opportunity to flow into an undesirable pattern on the interior of said pipeline or passageway,

(c) exerting a sufficient fluid pressure within the interior of said everted flexible tubular membrane so that said flexible tubular membrane will in turn exert a direct outward pressure against said cementitious lining that has been sprayed onto the interior of said pipeline, and

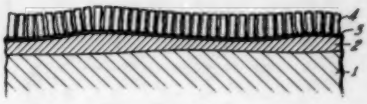
(d) maintaining said fluid pressure and said direct pressure until said sprayed lining no longer has a tendency to flow.

4,401,697

METHOD FOR PRODUCING COLUMNAR GRAIN CERAMIC THERMAL BARRIER COATINGS

Thomas E. Strangman, Phoenix, Ariz., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 109,956, Jan. 7, 1980, Pat. No. 4,321,311.
This application Dec. 4, 1981, Ser. No. 327,306
Int. Cl.³ C23C 11/00, 13/00
U.S. Cl. 427—250 8 Claims



1. A method for producing a metallic article having a durable ceramic thermal barrier coating, said method consisting essentially of:

a. providing a superalloy substrate with a clean surface

b. applying a thin uniform adherent layer of MCrAlY to the clean surface

c. applying a columnar ceramic coating to the MCrAlY layer by vapor deposition

d. heat treating the columnar ceramic coated article in an oxygen containing atmosphere to develop an alumina layer between the MCrAlY and the columnar ceramic coating.

4,401,698

HYDROPHILIC COATINGS FOR TEXTILE MATERIALS

Jeffrey A. Tripp, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Division of Ser. No. 188,210, Sep. 18, 1980, Pat. No. 4,352,917.
This application Dec. 18, 1981, Ser. No. 331,960
Int. Cl.³ B05D 3/02
U.S. Cl. 427—387 13 Claims

1. A process for treating a textile material which comprises treating the textile material with a silylated organic polymer and thereafter drying the treated material at a temperature of from 25° to 200° C., said silylated organic polymer is obtained from the reaction of a silylated aminofunctional polyether and a polymeric organic acid having at least one acid group per molecule, at a temperature of from −10° to 200° C., in which the polymeric organic acid is obtained from the polymerization of an organic acid having aliphatic unsaturation, said silylated aminofunctional polyether has the formula

$$\left[\begin{array}{l} CH_2(OC_nH_{2n})_xRA \\ | \\ CH(OC_nH_{2n})_xRA \\ | \\ CH_2(OC_nH_{2n})_xRA \end{array}\right]_a$$

where R is a radical selected from the group consisting of

$$\begin{array}{l} R^1 \\ | \\ -N- \end{array} \quad \text{and} \quad -\overset{\oplus}{N}(R^1)_3,$$

R^1 is selected from the class consisting of hydrogen, a monovalent hydrocarbon radical and a silicon containing radical selected from the group consisting of

(a) $$\begin{array}{l} R_c^3 \\ | \\ -R^2-Si-(OR^3)_{3-c} \end{array}$$

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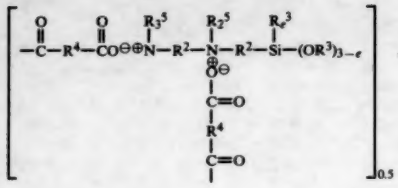
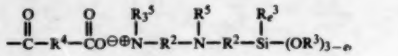
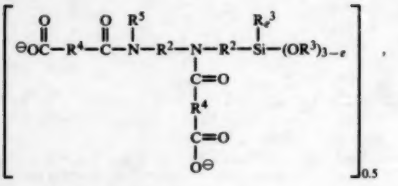
(b) 

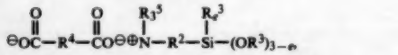
(c) 

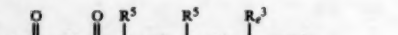
(d)

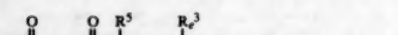
(e)

and when R is $-N^{\oplus}(R^1)_3$, A is an anionic silicon containing radical selected from the group consisting of

(f) 

(g) 

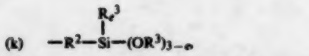
(h) 

(i) 

(j)

and when R is

then A is selected from the group consisting of hydrogen, a monovalent hydrocarbon radical, and a silicon containing radical selected from the group consisting of

(k) 

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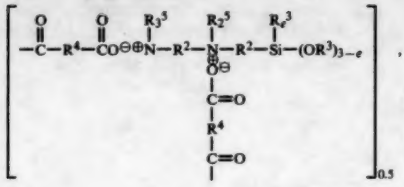
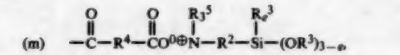
(l) 

(m) 

(n)

(o)

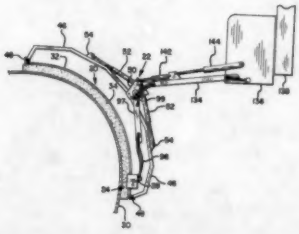
R^2 is a divalent radical, R^3 is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R^4 is a divalent hydrocarbon radical selected from the group consisting of $(CH_2)_y$, CH=CH or a cyclic hydrocarbon radical selected from the group consisting of C_6H_4, C_6H_8, C_6H_{10} and $C_{10}H_6$, R^5 is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical, with the proviso that at least one A or R^1 is a silicon containing radical, a is a number of from 0 to 4, e is 0, 1, 2 or 3, n is a number of from 2 to 4, x is a number of from 1 to 600 and y is a number of from 0 to 16.

4,401,699

SURFACE PROCESSING METHOD

Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash. 98441

Division of Ser. No. 196,640, Oct. 14, 1980, Pat. No. 4,305,344.
This application Aug. 10, 1981, Ser. No. 291,326
Int. Cl.[3] A23B *4/04*
U.S. Cl. 427—445 3 Claims



1. A method of processing variously contoured surfaces, comprising placing against the surface to be processed an elongated, pliant carriage support member and bending the support member to conform to the contour of the surface to be processed, moving a carriage along the bent support member at a substantially uniform spacing from the surface to be processed and treating the surface with a surface processing tool attached to the carriage.

4,401,700

COMPOSITION FOR DECORATIVE GRASS

Erwin H. Weder; Donald E. Weder, and Herbert A. Weder, all of Highland, Ill., assignors to Highland Manufacturing & Sales Co., Highland, Ill.

Filed Mar. 24, 1981, Ser. No. 247,108
Int. Cl.³ A41G 1/00
U.S. Cl. 428—17 10 Claims

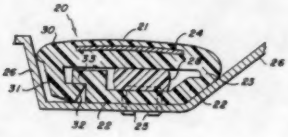
1. A resin packaging material in the form of decorative grass which meets Federal requirements for direct food contact packaging comprising a major proportion of a synthetic resin and a minor proportion of a colorant comprising a pigment insoluble in said resin, said pigment being colloidally dispersed throughout said resin to produce uniform color and transparency thereof, said pigment being selected from the group consisting of organic pigments and FD&C pigments.

4,401,701

FOLDABLE TRIM STRIP WITH MOUNTING PORTION

Dennis R. Wolters, Dayton, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio

Filed Jun. 29, 1982, Ser. No. 393,373
Int. Cl.³ B60R 13/04
U.S. Cl. 428—31 6 Claims



1. An elongated trim strip formed to include an elongated mounting portion, an elongated decorative portion extending to one side of said mounting portion and a thinner flexible web connection between the two foldably connecting the inner edges of said two portions, and at least one of the facing surfaces of said mounting portion and said decorative portion being provided with an adhesive layer for holding the two portions together when the decorative portion is folded down upon said mounting portion.

4,401,702

FILM LAMINATE AND PRODUCT POUCH OR TUBE THEREFROM

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,762
Int. Cl.³ B65D 73/00, 1/00; B32B 27/08; B29C 19/06
U.S. Cl. 428—35 6 Claims

1. A flexible film laminate comprising, two or more layers of polyacrylonitrile homopolymer films adhesively bonded together by means of a layer of a combination of a styrene-butadiene block copolymer, having a monomer ratio of from about 1:3 to about 3:1, and a random terpolymer of from about 30 to about 40 parts by weight of 1,3-pentadiene; about 30 to about 40 parts by weight of a monocyclic terpene and from about 25 to about 35 parts by weight of alpha methylstyrene, said combination consisting of from about 1 to about 3 parts by weight of the block copolymer to from about 3 to about 1 part by weight of the terpolymer, said laminate having been subjected to ultraviolet radiation to an extent resulting in a greater bond strength between layers than in the absence of said radiation.

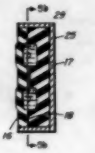
6. A method for forming a flexible film laminate comprising adhesively bonding together two or more layers of polyacrylonitrile homopolymer film by means of a layer of a combination of a styrene-butadiene block copolymer, having a monomer ratio of from about 1:3 to about 3:1, and a random terpolymer of from about 30 to about 40 parts by weight of 1, 3-pentadiene, about 30 to about 40 parts by weight of a monocyclic terpene and from about 25 to about 35 parts by weight of alpha methylstyrene, said combination consisting of from about 1 to about 3 parts by weight of the block copolymer to from about 3 to about 1 part by weight of the terpolymer, and thereafter subjecting the bonded region to ultraviolet radiation to an extent resulting in a greater bond strength between layers than in the absence of said radiation.

4,401,703

ANTIFOULING TILE CONTAINING ANTIFOULANT RESERVOIRS FOR IN SITU REPLENISHMENT

Stephen D. Rodgers, 3005 Trinity Dr., Bowie, Md. 20715

Filed Oct. 22, 1981, Ser. No. 313,892
Int. Cl.³ B32B 3/20
U.S. Cl. 428—72 8 Claims



1. A modular antifouling tile system for precluding the attachment of fouling organisms to articles for use in seawater comprising:

antifouling tile modules having a plurality of reservoirs for containing antifoulant and the material forming the body portion constructed of elastomeric material selected from the group consisting of butyl rubber, neoprene (polychloroprene), natural rubber, polybutylenes, polyisoprene, polybutadiene, polysulfide rubbers, polyurethanes, vinyls, polyacrylonitriles, polyisobutylene, and copolymer blends thereof blended with a resin material selected from the group consisting of polyvinyl chlorides, polystyrene, chlorinated natural rubber, polypropylene, and polyethylene forming the elastomeric body portion of the overall matrix, said elastomeric material of the matrix having a glass transition temperature of below 65° F. and the resin material of the matrix having a glass transition temperature above 75° F., with the proviso that the reservoirs may be cellular, in which they are isolated from each other, or interconnected, in which passages extend between each reservoir,

an antifoulant located in each reservoir selected from the group consisting of 2,4,5,6-tetrachloroisophtalonitrile, tributyltin fluoride, tripropyltin oxide, and tripropytin fluoride,

an insitu antifoulant indicia and replenishment means located on the surface as a protrusion or groove if interconnected for determining the depleted condition of the module and replenishment thereof, attachment means for securing the antifouling tile modules to the article for use in seawater, and wherein the antifoulant is blended with a chlorinated aliphatic hydrocarbon plasticizer in weight proportions ranging from about 1:1 to about 20:1 parts of plasticizer to parts of antifoulant.

4,401,704

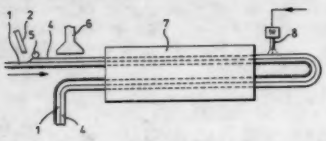
NON-STICK LATEX FOAM FLUOROCARBON CARPET BACKING

Michael Zegota, Brantford, Canada, assignor to Harding Carpets Limited, Rexdale, Canada

Filed Jun. 21, 1982, Ser. No. 390,414
Claims priority, application Canada, Mar. 24, 1982, 399238
Int. Cl.³ B32B 3/02, 33/00
U.S. Cl. 428—95 6 Claims

1. A carpet comprising an upper carpet layer and a lower

backing layer of latex high density foam rubber secured to an undersurface of the carpet layer, said backing layer having a



bottom surface substantially covered by a fluorocarbon compound bonded to the backing layer and reducing the tendency of the backing to stick to a floor on which the carpet is laid.

4,401,705

PLASTIC MOLDING

Abram Ewert, 6651 Brooks St., Vancouver, British Columbia, V5S 3J6, Canada

Filed Mar. 18, 1982, Ser. No. 359,620

Int. Cl.³ B32B *3/28, 3/30, 3/22*

U.S. Cl. 428—131 **6 Claims**

1. A pre-fabricated section suitable for use in supporting corrugated sheeting comprising.

(a) a hollow, open-bottom, elongated body section of a plastic material; the body section having a corrugated top wall and two generally planar side walls;

(b) one or more nail receiving openings penetrating the interior of the corrugated top wall;

(c) a tongue located at and projecting from one end of the body section, the tongue having at least one pin projecting from the surface of the tongue that corresponds with the corrugated surface of the body section; and

(d) at least one opening in the corrugated surface corresponding in size and respective location with the pin located on the tongue at the opposite end, located at the end of the body section opposite the tongue.

4,401,706

MULTI-PLY HEAT-INSULATING MATERIAL

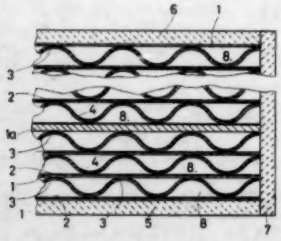
Heinz Sovilla, 2, Terrailles, 1304 - Cossonay, Switzerland

Filed Oct. 27, 1981, Ser. No. 315,469

Claims priority, application Switzerland, Oct. 29, 1980, 8023/80

Int. Cl.³ B32B *3/28, 3/12, 15/12*

U.S. Cl. 428—158 **10 Claims**



1. Multi-ply heat-insulating structure of which one side is exposed to heat, comprising a plurality of superposed webs of non-metallic supporting material assembled with cavities between successive webs, and a thin reflective metal layer bonded on one face only of each web facing said cavities, said cavities having a depth not less than 1 mm and said metal layer having a thickness of 1 to 20 microns and being on that face of the respective web which faces away from the side of said structure exposed to heat.

4,401,707

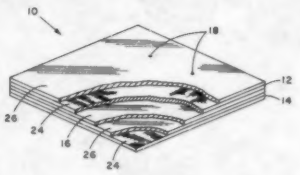
COMPOSITE HEAT PROTECTIVE FABRIC

Milton Bailey, Wayland; Kenneth Spindola, Hopdale, and Sumner H. Bernstein, Holliston, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1981, Ser. No. 328,320

Int. Cl.³ B32B *3/06, 15/14*

U.S. Cl. 428—166 **8 Claims**



1. A composite heat resistant fabric, comprising:

an outer layer of material having a radiant heat reflecting surface;

an inner layer of material having a radiant heat reflecting surface;

an intermediate heat conducting layer sandwiched between the outer and the inner layers; and

a plurality of fasteners for joining the outer, the inner and the intermediate layers at discrete locations and for forming a like multiplicity of heat-impeding air spaces between the outer and the intermediate layers and between the intermediate and the inner layers respectively.

4,401,708

NONWOVEN FABRIC AND METHOD OF BONDING SAME USING MICROWAVE ENERGY AND A POLAR SOLVENT

Thomas R. Paul, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 327,791

Int. Cl.³ B05D *3/02, 5/10;* **D04H** *1/54, 1/64*

U.S. Cl. 428—198 **9 Claims**

1. A method of producing a nonwoven fabric from a web of fibers, said fibers being substantially nonreactive to microwave energy, comprising applying a solvent having (1) sufficient polarity to be heated by microwave radiation and (2) a solubility parameter close to the solubility parameter of the fibers of the web to fibers in said web, subjecting the web to microwave energy at a temperature and for a time to heat said microwave heatable solvent sufficiently to cause bonding at at least some of the fiber intersections in said web thereby producing a nonwoven web.

9. A nonwoven fabric having individual fibers bonded at intersections by bonds weaker than the fibers, the tenacity of the fibers being not substantially less at bond points than at other points in the fiber.

4,401,709

OVERGLAZE INKS

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 280,920, Jul. 6, 1981, Pat. No. 4,377,642.
This application Jul. 9, 1982, Ser. No. 396,661
Claims priority, application United Kingdom, Oct. 17, 1980, 8033566
Int. Cl.³ H05K 1/03, 1/16, 3/12
U.S. Cl. 428—209 7 Claims

1. An electronic assembly comprising a circuit board having a multilayer integrated circuit thereon comprising a plurality of films, including conductor films and resistor films, a portion of said films having a coating of an overglaze ink comprising from about 60 to about 90 percent by weight of a glass powder and from about 8 to about 35 percent by weight of a suitable organic vehicle, said glass powder consisting essentially of:

(a) from about 58 to about 66 percent by weight of lead oxide;

(b) from about 12 to about 20 percent by weight of a modifier component consisting of from about 2 to about 6 percent by weight of cadmium oxide, from about 4 to about 8 percent by weight of zinc oxide, from about 0.1 to about 3 percent by weight of barium oxide and from about 0.1 to about 3 percent by weight of antimony trioxide; and

(c) from about 20 to about 27 percent by weight of a glass-forming component consisting of from about 0.1 to about 2 percent by weight of aluminum oxide, from about 14 to about 20 percent by weight of boron trioxide and from about 1 to about 7 percent by weight of silicon dioxide.

4,401,710

SOLAR CELL CARRIER MEMBRANE COMPRISING A FABRIC COMPOSED OF PLASTIC BANDS REINFORCED BY ARAMIDE FIBERS

Horst Bansemir, Munich, and Wolfgang Buchs, Valley, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,291
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110302
Int. Cl.³ B32B 27/02, 27/08, 27/12, 27/34
U.S. Cl. 428—229 11 Claims

1. Solar cell carrier membrane arranged to be stretched in a frame between two opposite sides with the direction between the two opposite sides defining the first direction of the membrane and the direction extending substantially perpendicularly of the first direction defining the second direction of the membrane, the membrane comprises plastic sheeting extending in the first and second directions and a fabric of woven bands extending transversely of one another located on the surface of said plastic sheeting, said bands forming said fabric are made of a fiber-reinforced plastic material, said bands comprising first bands and second bands said first bands extending in the first direction in generally parallel relation and spaced laterally apart from one another and said second bands extending transversely of said first bands and spaced laterally apart from one another, said first bands providing greater surface coverage of said plastic sheeting than said second bands, and said first and second bands are made of plastic reinforced with aromatic polyamide fibers.

4,401,711

CATION EXCHANGE MEMBRANE WITH HIGH EQUIVALENT WEIGHT COMPONENT

Raimund H. Silva, Hattingen, Fed. Rep. of Germany, and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 225,652, Jan. 16, 1981, abandoned. This application Nov. 2, 1981, Ser. No. 317,280
Int. Cl.³ B32B 7/00, 27/00; C25B 1/16
U.S. Cl. 428—252 8 Claims

1. A laminated multilayer cation exchange membrane consisting essentially of layers of

(a) fluorinated polymer with pendant side chains containing carboxyl groups,

(b) fluorinated polymer having pendant side chains containing sulfonyl groups and having an equivalent weight of about from 1100 to 1600 and at least about 200 units higher than layer (a), and

(c) fluorinated polymer having pendant side chains containing sulfonyl groups and having an equivalent weight that is about from 1000 to 1500 and at least about 100 units lower than layer (b), the layers being bonded together in the order specified.

4,401,712

ANTIMICROBIAL NON-WOVEN FABRIC

Willard L. Morrison, Winston-Salem, N.C., assignor to Tultex Corporation, Winston-Salem, N.C.

Filed Jan. 3, 1983, Ser. No. 454,977
Int. Cl.³ A61K 31/695; A01N 17/08
U.S. Cl. 428—289 3 Claims

1. A non-woven fabric comprising:

(a) a web of textile fibers formed according to the wetlaid process or the drylaid process;

(b) a polymeric base binding agent selected from the group containing acrylics, polyvinyl acetates, vinyl acetate-ethylenes, and styrene-butadine latexes; and

(c) said binding agent having a minor amount of an antimicrobial agent incorporated therein, said antimicrobial agent being non-cross-linked with binding agent, residing in cooloidal suspension within the amorphous zones of said polymeric base binding agent available to migrate to the surface of the binding agent and onto the textile fibers until the internal reservoir is exhausted.

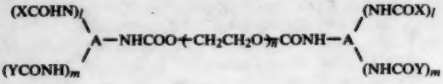
4,401,713

POLYESTER FIBER COMPOSITE MATERIAL USEFUL FOR REINFORCING RUBBER ARTICLES AND PROCESS FOR PRODUCING THE SAME

Tadahiko Takata, Ibaraki, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Sep. 10, 1981, Ser. No. 300,754
Claims priority, application Japan, Sep. 16, 1980, 55-127104; Sep. 16, 1980, 55-127105
Int. Cl.³ B05D 3/02; B32B 27/00; D02G 3/00
U.S. Cl. 428—290 43 Claims

1. A polyester fiber composite material useful for reinforcing rubber articles, comprising a substrate of a polyester fiber material impregnated with a polymeric impregnating material which comprises at least the four components of: (A) at least one polyepoxide composition, (B) at least one rubber latex, (C) at least one prepolymer of resorcin with formaldehyde and (D) from 0.1 to 10% of at least one water-soluble polyurethane compound based on the weight of the substrate, each of said components being heat-treated on said substrate at least once at a temperature of between 120° C. and the melting point of said polyester fiber material, said water-soluble polyurethane compound having the formula (I):



wherein A represents a tri- or hepta-valent radical, X represents a monovalent residue of a blocking compound having an activated hydrogen atom which residue is capable of dissociating from the polyurethane compound when said heat-treatment is applied thereto; Y represents a monovalent residue of an anionic radical-containing compound selected from the group consisting of aminosulfonic acids having 2 to 6 carbon atoms and aminocarboxylic acids having 1 to 6 carbon atoms; n represents an integer of 5 to 30, and; l and m represent an integer of 1 to 5, respectively, the sum of l and m is an integer of 2 to 6.

4,401,714

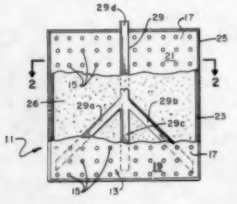
CORROSION RESISTANT POSITIVE ELECTRODE FOR HIGH-TEMPERATURE, SECONDARY ELECTROCHEMICAL CELL

Neil C. Otto, Chicago; Barry T. Warner, South Holland; John A. Smaga, Lemont, and James E. Battles, Oak Forest, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 7, 1982, Ser. No. 395,872

Int. Cl.³ H01M 4/58, 4/66

U.S. Cl. 429—221 **12 Claims**



1. A positive electrode for use in a high-temperature, secondary electrochemical cell opposite to a negative electrode including alkali metal or alkaline earth metal as active material, said positive electrode comprising a metal sulfide selected from the group consisting of FeS, alkali metal sulfide, alkaline earth metal sulfide and mixtures thereof; finely divided iron powder sufficient to provide a stoichiometric excess of Fe as FeS to the amount of combined sulfur in said metal sulfide and a current collector structure consisting essentially of low-carbon steel contacting the metal sulfide.

4,401,715

FIBER REINFORCED PLASTIC MOLDED ARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Isao Nomura; Masayoshi Hori, both of Toyama; Sotomi Goto, and Hirokazu Kittaka, both of Sagamihara, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

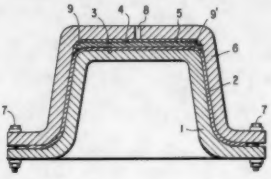
Filed Feb. 19, 1982, Ser. No. 350,367

Claims priority, application Japan, Feb. 23, 1981, 56-25117

Int. Cl.³ B32B 3/10

U.S. Cl. 428—306.6 **1 Claim**

1. A fiber reinforced plastic molded article containing as a reinforcing material a porous resin concrete plate comprising 100 parts by weight of a thermosetting resin, 20 to 50 parts by



weight of inorganic or organic hollow beads, and 50 to 100 parts by weight of an inorganic fine powder.

4,401,716

FOAM STRIP WOUND UP INTO A ROLL, PREFERABLY FOR SEALING PURPOSES

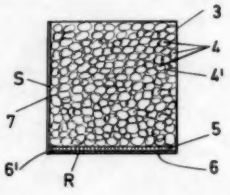
Rolf Tschudin-Mahrer, Lausen, Switzerland, assignor to Irbit Holding AG, Fribourg, Switzerland

Filed Aug. 20, 1982, Ser. No. 410,118

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133271

Int. Cl.³ B32B 7/12

U.S. Cl. 428—317.3 **15 Claims**



1. A strip of impregnated and compressed foam material with delayed restorability, wound up into a roll, forming a strip winding joint, wherein

said strip has side flanks and said roll defines broad sides comprising said side flanks, respectively, of the strip,

a liquid-impervious layer at one of said broad sides of said roll adheres to a corresponding of said side flanks of the strip,

said layer being expandable corresponding to the amount of restoration of the strip,

said layer being tearable along a spiral-shaped line corresponding to said strip winding joint.

4,401,717

HEAT-SENSITIVE RECORDING MATERIAL

Teppei Ikeda; Sadao Ishige; Nobuyoshi Sekikawa, all of Ashigara; Akira Igarashi, and Takekatsu Sugiyama, both of Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 23, 1981, Ser. No. 324,167

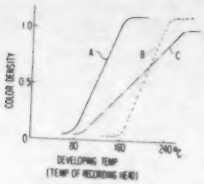
Claims priority, application Japan, Nov. 21, 1980, 55-164385

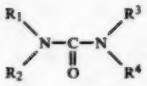
Int. Cl.³ B41M 5/18

U.S. Cl. 428—425.1 **2 Claims**

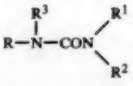
1. A heat-sensitive recording material comprising a base and one or more heat-sensitive color-forming layers provided on said base, wherein said color-forming layers contain an electron donating colorless dye and an electron accepting organic compound, and further wherein at least one of said color-forming layers contains either

(a) a urea compound having at least 7 carbon atoms represented by formula (I)



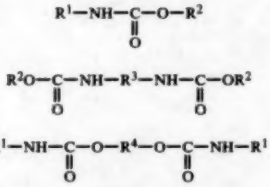

(I)

wherein R^1, R^2, R^3, R^4 each represents a hydrogen atom or a substituted or unsubstituted alkyl or aryl group; R^4 may also represent the group represented by formula (Ia)


(Ia)

wherein R is an alkylene, allylene, aralkylene, or oxyalkylene group; R^1, R^2 and R^3 have the same meaning as defined above; and the sum of the carbon atoms of the substituents represented by R^1, R^2, R^3, and R^4 in formula (I) is at least 6, or

(b) a urethane compound having at least 8 carbon atoms represented by formula (II), (III), or (IV)


(II)

(III)

(IV)

wherein R^1 is a substituted or unsubstituted alkyl group or aryl group; R^2 is a substituted or unsubstituted alkyl group; R^3 is an alkylene, allylene, aralkylene, or oxyalkylene group; and R^4 is an alkylene or oxyalkylene group.

4,401,718

PROCESS FOR APPLYING A SECOND SILICONE RESIN COATING COMPOSITION OVER A FIRST SILICONE RESIN COATING COMPOSITION

George F. Medford, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,772
Int. Cl.³ B32B 9/04; B05D 3/04; B29C 17/08
U.S. Cl. 428—448 **27 Claims**

13. An article comprising:

(a) a plastic substrate;

(b) a first silicone resin hard coating composition cured to said plastic substrate; and

(c) a second silicone resin hard coating composition cured to said first silicone resin hard coating composition, wherein curing of said second silicone resin hard coating composition to said first silicone resin hard coating composition is effected by:

(1) etching the surface of said first silicone resin hard coating composition with a caustic solution;

(2) applying said curable second silicone resin hard coating composition to the etched surface of said first silicone resin hard coating composition; and

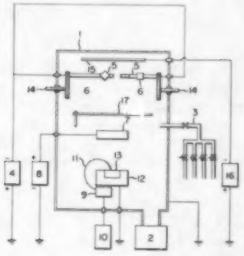
(3) curing said second silicone resin hard coating composition.

4,401,719

HIGHLY HARD MATERIAL COATED ARTICLES

Mitsunori Kobayashi, and Yoshihiko Doi, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 29, 1981, Ser. No. 258,550
Claims priority, application Japan, May 2, 1980, 55-57770
Int. Cl.³ B32B 15/04; B05D 3/06; C23C 15/00
U.S. Cl. 428—457 **4 Claims**



1. A highly hard material coated article which comprises a substrate of a tool or part thereof consisting of cermet, cemented carbide, tool steel or stainless steel and at least one highly hard material coated thereon selected from the group consisting of carbides, nitrides and carbonitrides of at least one of titanium, zirconium and hafnium and solid solutions thereof and those in which oxygen is dissolved, the crystals of the coated film being strongly orientated in the direction of <220> for the surface of the tool or part thereof so that the diffraction intensity ratio of the peak from the {220} plane and the secondly strong diffraction peak in the X-ray diffraction using Cu-Kα ray, that is, the diffraction intensity ratio is at most 15 of the latter to 100 of the former, and the half value width of the diffraction peak from the {220} plane of the coating film being at least 0.8° on a 2θ scale, said coating being formed by ion plating the substrate under conditions such that the accelerating voltage is high during the plating step for a short time in the initial stage sufficient to maintain said diffraction intensity ratio of the coated film as above and then lowering voltage sufficient to maintain said half value width to at least 0.8.

4,401,720

POLY(VINYL CHLORIDE) PLASTISOL COMPOSITIONS

Donald C. Davis; Richard L. McConnell, and Max F. Meyer, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 276,725, Jun. 24, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,213
Int. Cl.³ B32B 27/06, 27/36
U.S. Cl. 428—483 **12 Claims**

1. A composition having improved adhesion to polyester and polyvinyl chloride materials comprising

(a) a vinyl chloride resin selected from polyvinyl chloride and copolymers prepared from vinyl chloride and up to 30% of another copolymerizable vinyl monomer,

(b) a plasticizer for said vinyl chloride resin in an amount sufficient to form a plastisol, and

(c) from about 4 to about 20% by weight, based on the weight of said composition, of a saturated, linear thermoplastic polyester derived from about 100 mole % of a dicarboxylic acid and about 100 mole % of a glycol component, said polyester being dispersed in said plastisol, said polyester having a melting point of about 70° to about 200° C., a heat of fusion of about 10 calories per gram or less, and an inherent viscosity of about 0.3 to about 1.0.

4,401,721

THERMOSENSITIVE RECORDING MATERIALS

Yoshiaki Hida, Kawasaki, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 322,756

Int. Cl.³ B41M *5/18*

U.S. Cl. 428—484 **14 Claims**

1. A laminated thermosensitive recording material comprising a substrate, a primer layer adjacent to said substrate comprising a primer resin and an acidic developer, a first thermosensitive layer adjacent to said primer layer comprising a solid vehicle with an acidic developer dispersed therein, and a second thermosensitive layer adjacent to said first thermosensitive layer comprising a solid vehicle with a leuco-dye dispersed therein.

4,401,722

TRANSFER PAPERS

Yoshi Matsui, 28-15, 2-chome, Asakusabashi, Taito-ku, Tokyo, Japan

Division of Ser. No. 267,332, May 26, 1981, Pat. No. 4,370,362. This application Sep. 24, 1982, Ser. No. 422,659

Claims priority, application Japan, May 27, 1980, 55-70357

Int. Cl.³ B32B *9/06*

U.S. Cl. 428—488 **2 Claims**

1. A transfer paper comprising a base material and on at least one surface thereof, a water-soluble, water-dispersible transfer coating comprising cobalt thiocyanate, wax, a non-ionic surfactant and another surfactant.

4,401,723

CAPSULES AND PRESSINGS FOR EXTRUDING OBJECTS, PARTICULARLY TUBES, AND A PROCESS FOR PRODUCING THE CAPSULES AND PRESSINGS

Christer Åslund; Åke Åkerman; Hans Eriksson, and Benny Flodin, all of Torshälla, Sweden, assignors to Granges NYBY AB, Nybybruk, Sweden

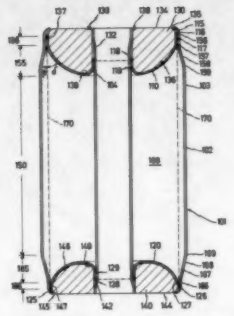
Filed Oct. 26, 1979, Ser. No. 88,479

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846660

Int. Cl.³ B22F *3/00*

U.S. Cl. 428—554 **35 Claims**

1. A capsule having an annular transverse cross section for isostatically producing a pressing for use in the extrusion of dense metallic tubes, said capsule comprising a tubular thin-walled sheet metal container to be filled with a powder and having plug-like inserts for closing each of its opposite ends, at least one of inner and outer peripheral walls of the capsule having a longitudinal profile of varying diameter by being provided with a substantially cylindrical section at each end, the diameter of which corresponds substantially exactly to the required diameter of the pressing and a bulge which is directed radially outwardly relative to a longitudinal axis of the capsule and a direction in which shrinkage will occur during isostatic pressing of the powder to form said pressing, the dimensions of said bulge being selected such that said bulge will be substantially eliminated by said shrinkage, wherein said bulge has a substantially cylindrical center section of a substantially constant diameter and conically tapering transitional regions, said central section extending substantially over the entire distance



between the inserts and being connected to said substantially cylindrical end sections by said transitional regions, each of which tapers from an end of said central section to an adjacent one of said end sections.

4,401,724

SPRAY-AND-FUSE SELF-FLUXING ALLOY POWDER COATING

Larry N. Moskowitz, Mentor, and Erhard Klar, Beachwood, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 870,339, Jan. 18, 1978, Pat. No. 4,192,672. This application Oct. 3, 1979, Ser. No. 81,355

Int. Cl.³ B22F *7/00*

U.S. Cl. 428—564 **7 Claims**

1. A metal article coated with a fused coating of a boron-containing nickel or cobalt spray-and-fuse, self-fluxing alloy powder containing hard precipitates of chromium boride which precipitates are internally precipitated, at least about 5% of said precipitates by volume of said powder having an average size of from about 10 microns to about 50 microns.

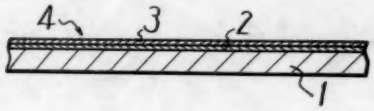
6. The metal article of claim 1 wherein said alloy powder is a blend of alloy powder containing primary and secondary distributions of hard precipitates of chromium boride which primary and secondary distributions are internally precipitated and conventionally atomized powder, at least about 5% of said precipitates by volume of said blend having an average particle size of from 10 microns to 50 microns.

4,401,725

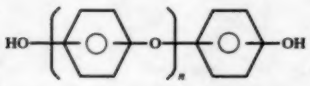
MAGNETIC RECORDING MEDIUM

Kazunori Ozawa, Tomiya; Takahiro Kawana; Nakaharu Seki, both of Tagajyo, and Naoya Komada, Sendai, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,346
Claims priority, application Japan, Sep. 14, 1981, 56-145182
Int. Cl.³ B32B 15/04
U.S. Cl. 428—457 5 Claims



1. A magnetic recording medium comprising a non-magnetic substrate and thin film metal magnetic layer formed thereon, said magnetic recording medium carrying polyphenyl ether compound having following formula



wherein n is an integer satisfying the following condition:

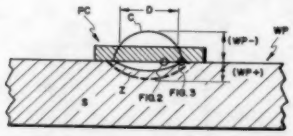
$2 \leqq n \leqq 10$.

4,401,726

METAL SURFACE MODIFICATION

Daniel S. Gnanamuthu, Weymouth, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Continuation of Ser. No. 26,875, Apr. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 611,628, Sep. 8, 1975, Pat. No. 4,015,100, and a continuation-in-part of Ser. No. 431,240, Jan. 7, 1974, abandoned. This application Dec. 21, 1981, Ser. No. 332,964
Int. Cl.³ B05D 3/06
U.S. Cl. 428—610 16 Claims



1. Surface layer alloy casing production method comprising,

coating a preselected area of a metal substrate with a metal layer, the substrate thickness being such to constitute a virtually infinite heat sink relative to the coating,

the coating metal liquidus or melting point being at least 200° C. higher than that of the substrate,

scanning said area with a laser beam at speed and power density which in conjunction with conductivity of the selected substrate material provides a rapid heatup including melting of the entire coating and a predetermined thickness of the subtrate corresponding to its share of the alloy casing in less than two seconds and rapid cool down and resolidification of the melt to produce a 99% of theoretical density alloy casing entirely incorporating said coated-on metal layer and said sustrate thickness which is melted, with particles of the coating material in a matrix of a eutectic of coating and substrate materials metallurgically diffusion bonded to the substrate, said particles of the original coating material being concentrated upwardly within said casing and preventing oxidation of the melt,

the process being controlled to induce a substantial mixing of the entirely melted coating and melted substrate layer and a precipitation out of particles of the original coating material into said matrix before the matrix freezes.

11. Product as made by the process of claim 1.

4,401,727

FERROUS PRODUCT HAVING AN ALLOY COATING THEREON OF AL-ZN-MG-SI ALLOY, AND METHOD

Neal S. Berke, Allentown, and Herbert E. Townsend, Center Valley, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 23, 1982, Ser. No. 391,217
Int. Cl.³ B32B 15/18, 15/20
U.S. Cl. 428—610 18 Claims

1. In a corrosion resistant ferrous article comprising a ferrous base rendered corrosion resistant to both SO_2 and salt water-containing environments by a ductile, adherent, coating metallurgically bonded to a surface thereof, said coating having an alloy overlay and an intermetallic alloy layer intermediate said overlay and said ferrous base, the improvement wherein said overlay is an alloy from essentially within the quaternary Al-Zn-Si-Mg system having a metallurgical structure containing (1) cored aluminum-rich dendrites having dendrite arm spacings (DAS) of less than 10μ, (2) zinc-rich interdendritic regions, and (3) intermetallic phases of zinc, aluminum, magnesium and silicon; said alloy consisting essentially of, by weight, 3–20% magnesium and 3–15% silicon, balance aluminum and zinc, where the

$$\frac{\text{(Al weight percent)}}{\text{(Zn weight percent)}}$$

is between 1 and 1.5.

10. In a method for producing a metallic coating metallurgically bonded to a ferrous base, comprising the steps of (1) preparing a surface of said ferrous base for the reception of a metallic coating; (2) coating said surface with a molten alloy from essentially within the quarternary Al-Zn-Mg-Si system; and (3) cooling said coating to solidify the coating and form a ductile, adherent coating on said ferrous base, wherein said coating consists of an alloy overlay on a thin layer of an intermetallic alloy layer adjacent the ferrous base, the improvement wherein the molten alloy consists essentially of, by weight, magnesium from 3% to 20%, silicon from 3% to 15%, balance aluminum and zinc, where the

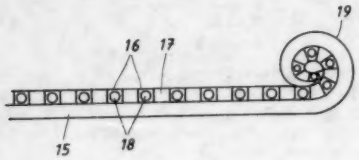
$$\frac{\text{(Al weight percent)}}{\text{(Zn weight percent)}}$$

is between 1 and 1.5 thereby forming cored dendritic containing coating.

4,401,728
COMPOSITE MATERIAL

Hans Larker, Robertsfors, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Mar. 15, 1981, Ser. No. 243,518
Claims priority, application Sweden, Mar. 27, 1980, 8002365
Int. Cl.³ B32B 15/02
U.S. Cl. 428—614 4 Claims



1. A composite material comprising a matrix of an alloy of iron and nickel having a coefficient of thermal expansion of at the most $3 \cdot 10^{-6} K^{-1}$ within the temperature range 20° C. to 100° C. and a plurality of spaced-apart veins of copper, all extending in substantially the same direction in the matrix, with the copper in each vein and the alloy of the matrix bonded to each other metallurgically through a boundary layer containing copper and the alloy and having a thickness of at least 0.01 to at most 5 μm, the metallurgical bond at each boundary layer being produced by joining the components of the composite material in a solid state.

4. A composite material as claimed in claim 1 or claim 3, in which the thermal conductivity is in the range 75 to 150 $W \cdot m^{-1} \cdot K^{-1}$ in the direction of the copper veins.

4,401,729
HIGH-STRENGTH CERAMIC LAMINATED TUBE AND THE PRODUCTION AND USE THEREOF

Nils Claussen, Brandenburger Strasse 13, D-7250 Leonberg 7, and Günter Petzow, Tannenweg 7, D-7022 Leinfelden-Echterdingen 1, both of Fed. Rep. of Germany

Filed Jan. 25, 1979, Ser. No. 6,836
Claims priority, application Fed. Rep. of Germany, May 17, 1978, 28215954
Int. Cl.³ F41F 17/08, 17/06
U.S. Cl. 428—623 9 Claims

1. High-strength ceramic composite tube comprising an inner tube of ceramic material and at least one outer tube of a metal or ceramic material shrunken onto the inner tube to yield a compressive stress of at least 680 MPa.

4,401,730
SEALED DEEP CYCLE LEAD ACID BATTERY

Joseph Szymborski, Bartlett; Sudhansu S. Misra, Hoffman Estates; Mark L. Eggers, Lake In The Hills, and Brian W. Burrows, Rolling Meadows, all of Ill., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Continuation-in-part of Ser. No. 193,568, Oct. 3, 1980, abandoned. This application Sep. 22, 1981, Ser. No. 304,475
Int. Cl.³ H01M 2/12
U.S. Cl. 429—53 12 Claims

1. A maintenance-free, absorbed electrolyte, lead-acid cell capable of enduring deep discharge and rapid recharge cycling, with long cycle life, comprising:

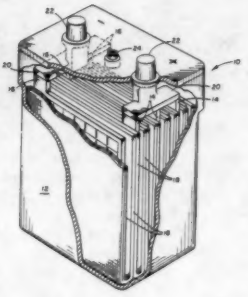
a container normally sealed from the atmosphere in service;

a plurality of positive plates in said container, each of said plates comprising a self-supporting grid of a lead alloy containing no more than about 2% antimony based upon the total weight of the alloy, and positive active material on said grid;

a plurality of negative plates in said container, each of said plates comprising a self-supporting grid of essentially antimony-free lead alloy and negative active material pasted on said grid;

sulfuric acid electrolyte in an amount sufficient to provide a desired capacity and an electrolyte-starved condition;

separator material intimately contacting and separating said positive and negative plates, said separator material being at least 70% porous, easily wetted, and capable of wicking the electrolyte;



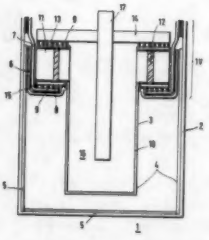
said electrolyte being substantially completely absorbed in said plates and separators; and

said separators providing a sufficient void volume in service to permit transport of oxygen gas generated during recharge at a sufficient rate so that pressure in the cell does not normally exceed about 10 psig.

4,401,731
ELECTROCHEMICAL STORAGE CELL

Günther Steinleitner, Schriesheim, Fed. Rep. of Germany, assignor to Brown, Boveri and Cie AG, Käfertal, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,951
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033438
Int. Cl.³ H01M 2/08
U.S. Cl. 429—104 10 Claims



1. Electrochemical storage cell based on alkali metal and chalcogen, with at least one anode space to receive the alkali metal anolyte and a cathode space to receive the chalcogen catholyte, which spaces are separated from each other by an alkali ion conducting solid electrolyte and are bounded by a metallic housing, a closure in a sealing zone at the top of said storage cell, said solid electrolyte having a can shape and bonded at its open end by a bonding material to a ring shaped insulating part which defines the two reactant spaces relative to each other in the sealing zone of the storage cell closure, the combination therewith wherein, in the sealing zone of the storage cell closure, the metallic housing as well as the solid electrolyte and the insulating part fastened to it are covered by a protective layer, wherein the protective layer of the metallic

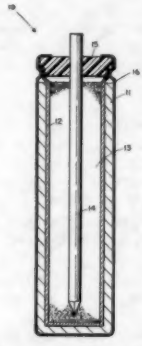
housing is disposed in the area of the latter's opening between the exterior of the solid electrolyte and the interior of the metallic housing, wherein the protective layer of the metallic housing is retained by means of a metallic sleeve, wherein the sleeve is fastened to the inside of the open end of the metallic housing, wherein the sleeve is provided with an inwardly pointing flange, and wherein the protective layer is bent cylindrically and pushed between the metallic housing and the sleeve.

4,401,732

FLUID CATHODE DEPOLARIZED CELL

Noble E. Hamilton, Middleton, Mass., assignor to Duracell Inc., Bethel, Conn.

Filed Jan. 26, 1982, Ser. No. 342,955
Int. Cl.³ H01M 4/36
U.S. Cl. 429—105 **14 Claims**



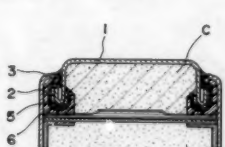
1. A small diameter cylindrical electrochemical cell having an anode comprised of an alkali or alkaline metal, a fluid cathode depolarizer/electrolyte solvent with electrolyte salt dissolved therein and an inert cathode made of a carbonaceous powder all contained within a cell container characterized in that the inner diameter of said cell container is less that about one inch (2.5 cm) and said fluid cathode depolarizer and said carbonaceous material are in admixture as a slurry within said cell wherein said carbonaceous powder comprises from 1.7 to 7.8% by volume of said slurry.

4,401,733

ALKALINE GALVANIC CELL

Iwao Shirai; Keigo Momose; Tadashi Sawai, all of Hirakata; Masakazu Komatsu, Kashihara; Takao Inoue, Hirakata, and Tamotsu Wakahata, Kutano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 22, 1981, Ser. No. 333,616
Claims priority, application Japan, Dec. 26, 1980, 55-186362
Int. Cl.³ H01M 2/08
U.S. Cl. 429—174 **4 Claims**



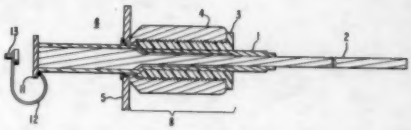
1. An alkaline galvanic cell which comprises an anode sealing plate in the form of a layered clad plate which has a copper layer as the innermost layer thereof and in which an anode active substance is accommodated, a cathode container in which a cathode active substance is accommodated, an insulating packing provided around the peripheral edge of said anode sealing plate which is fitted into said cathode for hermetically sealing said cell, and first and second layers of sealing agents provided between said innermost copper layer of said anode sealing plate and said insulating packing, said first layer which contacts said innermost copper layer of said anode sealing plate being of epoxy adduct polyamide amine, and said second layer which contacts said insulating packing being of chlorosulfonated polyethylene.

4,401,734

INSULATED FEEDTHROUGH EXPANSION SEAL

Theodore O. Meyer, Sunnyvale, and Gerrit van Ommering, San Francisco, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Aug. 28, 1981, Ser. No. 297,374
Int. Cl.³ H01M 2/06
U.S. Cl. 429—181 **3 Claims**



1. A feedthrough seal assembly for providing electrical insulation between an inner conductor and an outer conductor, comprising:

an outer electrical conductor roughly in the shape of a hollowed-out cylinder;

disposed within said outer conductor, a compressible dielectric roughly in the shape of a hollowed-out cylinder;

disposed within said dielectric, a deformable inner electrical conductor roughly in the shape of a hollowed-out cylinder; and

disposed within said inner conductor, a rigid pin roughly in the shape of a cylinder,

wherein said pin has a compressing region having a first outer diameter and a push/pull region having a second outer diameter smaller than said first outer diameter.

4,401,735

NON-AQUEOUS LI/MNO_2 CELL

Peter R. Moses, Windham, N.H.; Alwyn H. Taylor, Wellesley Hills, and Michael J. Turchan, Sudbury, both of Mass., assignors to Duracell International Inc., Bethel, Conn.

Filed Dec. 28, 1979, Ser. No. 107,962
Int. Cl.³ H01M 6/16
U.S. Cl. 429—195 **5 Claims**

1. An electrochemical cell comprising a lithium anode, a manganese dioxide cathode having water retained therein and an electrolyte, wherein said electrolyte comprises an electrolyte salt dissolved in a non-aqueous electrolyte salt solvent comprised of 1,3 dioxolane substantially free of impurities which react with lithium.

4,401,736

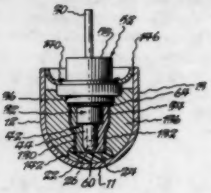
ANODE ASSEMBLY FOR LITHIUM-HALOGEN CELL

Robert A. Zayatz, North Tonawanda, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Continuation of Ser. No. 222,498, Jan. 5, 1981. This application Jun. 16, 1982, Ser. No. 389,038
Int. Cl.³ H01M 4/02
U.S. Cl. 429—211 **14 Claims**

1. An anode assembly for a lithium-halogen cell including a halogen-containing cathode material, said anode assembly

comprising an anode electrical conductor sandwiched between a pair of lithium plates defining substantially oppositely-directed lithium surfaces terminating in a peripheral lithium edge disposed between said surfaces and characterized by a



major portion of the length of said peripheral edge being uncovered and exposed, a minor portion of the length of said peripheral edge being covered by an element of electrical insulating material, thereby increasing the area of lithium for operative contact with the cathode material of the cell.

4,401,737

PROTECTIVE ACTIVE NITRIDES AS ADDITIVES TO NONAQUEOUS CATHODE MATERIALS

Ashok V. Joshi, Fishkill, N.Y., assignor to Rayovac Corporation, Madison, Wis.

Division of Ser. No. 190,195, Sep. 24, 1980, Pat. No. 4,304,764. This application Aug. 10, 1981, Ser. No. 291,244

Int. Cl.³ H01M 4/50

U.S. Cl. 429—218 5 Claims

1. A stabilized cathode for use in a non-aqueous electrochemical cell having an active metal as the anode comprising on a mole basis a predominate amount of a stoichiometric cathode active material in intimate contact with an in-situ produced compound of said active metal and chemical species resulting from chemical reduction of cathode active material.

4,401,738

X-RAY LITHOGRAPHY MASK

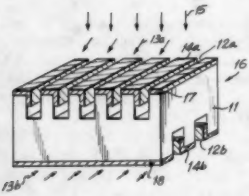
Seiichi Iwamatsu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,997

Claims priority, application Japan, Nov. 18, 1980, 55-162395

Int. Cl.³ G03C 5/00

U.S. Cl. 430—5 11 Claims



1. An X-ray lithography mask having complex patterns of X-ray absorbing material on a thin membrane, comprising:

a thin membrane having opposed substantially planar surfaces, the first of said planar surfaces having a first pattern of grooves selectively formed thereon and the second planar surface having a second independent pattern of grooves, X-ray absorbing material obliquely deposited on said first and second pattern of grooves, the first and second patterns disposed on the respective surfaces of the membrane for providing a selected complex image pattern on an X-ray sensitive substrate when the mask is irradiated by X-ray irradiation.

4,401,739

METHOD FOR TREATING LITHOGRAPHIC PRINTING PLATES (II)

Takao Senga; Masafumi Koishi, and Yasuo Tsubai, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation of Ser. No. 191,017, Sep. 26, 1980, abandoned, which is a continuation of Ser. No. 30,605, Apr. 11, 1979, abandoned. This application Apr. 2, 1982, Ser. No. 365,089

Claims priority, application Japan, Apr. 18, 1978, 53-45536

Int. Cl.³ G03C 1/33; G03F 7/06

U.S. Cl. 430—16 10 Claims

1. A method for improving printing characteristics of lithographic printing plates having an image of silver per se formed by the silver diffusion transfer process as the ink receptive areas, at least one of the constitutive layers of said plates containing a hydrophilic high molecular weight binder in addition to a second polymer,

said method comprising using a polymer compound in at least one location selected from the group consisting of:

(i) at least one of the hydrophilic high molecular weight binder-containing constitutive layers of said plates which has said image of silver or silver halide;

(ii) at least one of the processing solutions used in the printing plate making process; and

(iii) at least one of the processing solutions used in a printing operation, provided in (ii) and (iii) that said hydrophilic high molecular weight binder and said polymer compound are ultimately present in the same layer, said polymer compound containing in its principal and/or side chain an aromatic nucleus bearing a hydrophilic substituent group,

wherein the aromatic nucleus is benzene, naphthalene, phenanthrene, anthracene, pyrene or naphthacene, and the hydrophilic substituent is a sulfonic acid group, a hydroxyl group, a carboxyl group, a quaternary ammonium group, a phosphoric acid group or a salt thereof.

4,401,740

ELECTROGRAPHIC DEVELOPMENT PROCESS

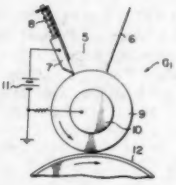
Toshiyasu Kawabata, Sunto; Hachiro Tosaka, Susono, and Toshiki Nanya, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,213

Claims priority, application Japan, Jan. 16, 1981, 56-5418

Int. Cl.³ G03G 13/08, 13/09

U.S. Cl. 430—102 10 Claims



1. An electrographic development process comprising the steps of:

forming a layer of a developer composition which layer has a thickness in the range of from 150 μm to 300 μm, said developer comprising a blend of (a) high resistivity toner particles having a volume resistivity of at least 10^{12} Ωcm and an average particle size in the range of from 5 μm to 20 μm, and (b) electrically conductive particles having a volume resistivity of 10^{9} Ωcm or less and an average particle size in the range of from 1/5 to 4/5 the average particle size of said high resistivity toner particles (a), the mixing ratio by weight of said electrically conductive

particles (b) to said high resistivity toner particles (a) being in the range of 1:99 to 40:60;

subjecting said layer of said developer composition to charge injection to a potential in the range of from 150 V to 500 V; and then

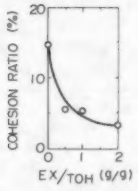
moving said layer of said charged developer composition into contact with or in close proximity to a latent electrostatic image having a polarity opposite to that of said charged developer composition, thereby developing said latent electrostatic image and forming a visible image as a result of the electric attraction between said developer composition and said latent electrostatic image.

4,401,741

ONE-COMPONENT TYPE DEVELOPER

Nobuhiro Miyakawa, Suita, and Kouzi Mackawa, Kyoto, both of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed May 27, 1982, Ser. No. 382,605
Claims priority, application Japan, May 29, 1981, 56-80980
Int. Cl.³ G03G *5/04*
U.S. Cl. 430—110 **4 Claims**



1. An electrically insulating, magnetic one-component type developer comprising an electrically insulating binder medium, and a magnetic material powder and a charge control agent dispersed in the binder medium, wherein the charge control agent comprises a negative or positive charge control agent and a charge control agent having a polarity opposite to that of said charge control agent at a weight ratio of from 1/0.05 to 1/1.5.

4,401,742

PREPARATION OF POSITIVE TONERS BY ACID TREATMENT

Albert C. Chiang, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,135
Int. Cl.³ G03G *9/08*; C08J *3/20*
U.S. Cl. 430—137 **9 Claims**

1. A method for the preparation of toner particles comprising the steps of:

(a) forming a homogeneous dispersion of both carbon black particles and particles of a second pigment saturated with monomer and initiator by (i) initimately mixing at least one monomer, carbon black, paricles of the second pigment and a polymerization initiator and (ii) adding the mixture to a mixture of sufficient water and at least one alcoholic dispersing agent to form a homogeneous dispersion solution;

(b) heating said solution to a temperature sufficient to substantially complete the polymerization of said monomer and form a homogeneous polymeric dispersion of said carbon black particles and the particles of said second pigment;

(c) adding to said polymeric dispersion a weak organic acid or a weak acid anhydride in an amount sufficient to substantially complete the esterification of said alcoholic dispersing agent; and

(d) recovering the toner particles.

4,401,743

AQUEOUS DEVELOPABLE PHOTOSENSITIVE COMPOSITION AND PRINTING PLATE

Joseph H. Incremona, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 145,025, Apr. 30, 1980, abandoned. This application Feb. 3, 1982, Ser. No. 345,339
Int. Cl.³ G03C *1/54, 1/60, 1/71*
U.S. Cl. 430—157 **12 Claims**

1. A light sensitive adduct comprising the combination of a diazo resin having a plurality of pendant diazonium groups, with a sulfonated polymer having a plurality of sulfonate groups, said sulfonated polymer being selected from the group consisting of sulfonated polyesters and sulfonated polyurethanes.

7. A presensitized light-sensitive article comprising a substrate having coated on one surface thereof a light-sensitive coating comprising an adduct, said adduct comprising the combination of a diazo resin having a plurality of pendant diazonium groups and a sulfonated polymer having a plurality of sulfonate groups, said sulfonated polymer being selected from the group consisting of sulfonated polyesters and sulfonated polyurethanes.

4,401,744

DIAZOTYPE COMPOSITIONS WITH IMPROVED PRINTING PERFORMANCE

Peter Muller, Port Washington, N.Y., assignor to Andrews Paper & Chemical Co., Inc., Port Washington, N.Y.

Continuation of Ser. No. 835,495, Sep. 22, 1977, abandoned. This application May 6, 1981, Ser. No. 260,930
Int. Cl.³ G03C *1/60*
U.S. Cl. 430—179 **30 Claims**

1. A light sensitive diazo coating composition which comprises;

a light sensitive diazonium compound;

1,3-dimethylurea;

a diazonium stabilizing proportion of citric acid; and

a print accelerating proportion of a compound selected from the group consisting of urea, thiourea and mixtures thereof.

4,401,745

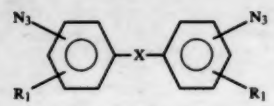
COMPOSITION AND PROCESS FOR ULTRA-FINE PATTERN FORMATION

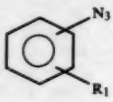
Hisashi Nakane, Kawasaki; Wataru Kanai, Samukawa, and Minoru Tsuda, Isehara, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kawasaki, Japan

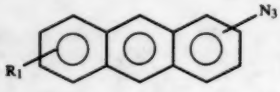
Filed Aug. 26, 1981, Ser. No. 296,358
Claims priority, application Japan, Aug. 29, 1980, 55-118398
Int. Cl.³ G03C *1/52*
U.S. Cl. 430—197 **21 Claims**

1. A composition for ultra-fine pattern formation comprising: (a) at least one polymer; and (b) an amount of an aromatic azide compound of from 5 to 30% by weight based on said polymer effective for reacting with said polymer to improve plasma resistance of said polymer when said composition is irradiated with an active radiation after being coated on a substrate and dried to form a solid film on the substrate,

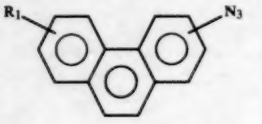
wherein said polymer is selected from the group consisting of polymethyl methacrylate, polymethylisopropenyl ketone, polyvinyl chloride, polyvinyl acetate, a copolymer of vinyl chloride and vinyl acetate, a copolymer of vinyl chloride and acrylic acid, polyisopropylvinyl ketone, polybutyl methacrylate and poly-2-chloroethyl acrylate, said polymer having a molecular weight in the range of from tens of thousands to two million; and wherein said aromatic azide compound is represented by the following formulas:



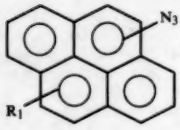


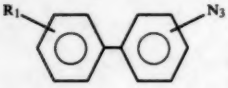


(iii)



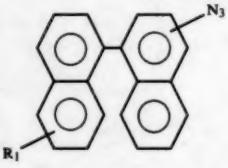
(iv)



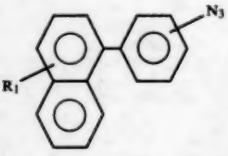


(v)

(vi)

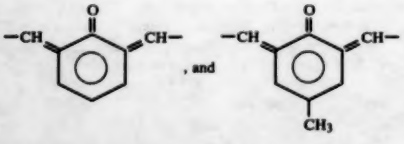


(vii)



(viii)

where X represents —O—, —CO—, —CH_2—, —S—, —SO_2—, —CH=CH—, —CH=CH—CO—CH=CH—, —CH=CH—CO—,



and R_1 represents hydrogen atom, a halogen atom, an azide group, a lower alkyl group or a halogenated lower alkyl group.

4,401,746

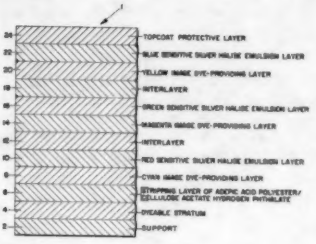
STRIPPING LAYER CONSISTING OF A MIXTURE OF CELLULOSE ACETATE HYDROGEN PHTHALATE AND STRAIGHT CHAIN SATURATED POLYESTER OF ADIPIC ACID

William J. Pfingston, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 24, 1982, Ser. No. 381,437

(i) **Int. Cl.³ G03C** *1/40, 1/90*

U.S. Cl. 430—215 **11 Claims**


TOPCOAT PROTECTIVE LAYER
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER
YELLOW IMAGE DYE-PROVIDING LAYER
INTERLAYER
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER
MAGENTA IMAGE DYE-PROVIDING LAYER
INTERLAYER
RED SENSITIVE SILVER HALIDE EMULSION LAYER
CYAN IMAGE DYE-PROVIDING LAYER
STRIPPING LAYER OF ADIPIC ACID POLYESTER/ CELLULOSE ACETATE HYDROGEN PHTHALATE
DYEABLE STRATUM
SUPPORT

1. A photograhic product which comprises a laminate which contains a plurality of layers including, in sequence, a support; an image-receiving component comprising a dyeable stratum; a stripping layer consisting of a mixture of cellulose acetate hydrogen phthalate and straight chain saturated polyester of adipic acid; and a photosensitive component comprising a gelatin layer contiguous with said stripping layer, said photosensitive component containing photosensitive silver halide dispersed in said gelatin layer or in a separate layer and an image dye-providing material associated with said silver halide in the same or a different layer.

4,401,747

STRIPPING COMPOSITIONS AND METHODS OF STRIPPING RESISTS

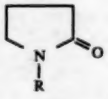
Irl E. Ward, Jr.; Lisa G. Hallquist, and Thomas J. Hurley, all of Easton, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Sep. 2, 1982, Ser. No. 413,996

Int. Cl.³ G03C *5/00;* **B08B** *7/00;* **B01F** *1/00;* **C09D** *9/00*

U.S. Cl. 430—258 **32 Claims**

1. A stripping composition comprising from about 30 to about 90 weight percent of a 2-pyrrolidinone compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms and hydroxyalkyl of 1 to 3 carbon atoms, and from about 10 to about 70 weight percent of a dialkyl sulfone compound of the formula

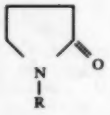
wherein R^1 and R^2 are alkyl of 1 to 4 carbon atoms.

4,401,748
STRIPPING COMPOSITIONS AND METHODS OF STRIPPING RESISTS

Irl E. Ward, Jr., and Lisa G. Hallquist, both of Easton, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Sep. 7, 1982, Ser. No. 415,161
Int. Cl.³ B08B 7/00; C11D 1/18; B01F 1/00; G03C 5/00
U.S. Cl. 430—258 32 Claims

1. A stripping composition comprising from about 30 to about 90 weight percent of a 2-pyrrolidinone compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms and hydroxyalkyl of 1 to 3 carbon atoms, and from about 10 to about 70 weight percent of tetrahydrofuran.

4,401,749
MULTI-LAYER ELEMENTS SUITABLE FOR THE PRODUCTION OF PRINTING PLATES AND RELIEF PLATES, AND THEIR PRODUCTION

Gerhard Hoffmann, Otterstadt, and Peter Richter, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,196
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107741
Int. Cl.³ G03C 1/78
U.S. Cl. 430—271 9 Claims

1. A multi-layer element suitable for the production of printing plates and relief plates, and comprising

(a) a photosensitive layer of a mixture which is soluble and/or dispersible in aromatic hydrocarbon solvents or aliphatic halohydrocarbon solvents and consists essentially of

(a1) at least one elastomeric polymer as the binder,

(a2) at least one photopolymerizable, ethylenically unsaturated monomer compatible with the binder, and

(a3) at least one photopolymerization initiator activatable by actinic light, with or without

(a4) conventional additives

(b) a sheet-like polyester shaped articles as a dimensionally stable base for the photosensitive layer (a) and

(c) a 2–25 μm thick adhesive layer between the photosensitive layer (a) and the dimensionally stable base (b), which adhesive layer consists essentially of a reaction product, which is insoluble in the process solvents used during the production, processing or use of the multi-layer element, of

(c1) from 99 to 55% by weight, based on the sum of the components (c1) and (c2), of a cellulose ether which is crosslinkable and hardenable with an isocyanate, and

(c2) from 1 to 45% by weight, based on the sum of the components (c1) and (c2), of a polyisocyanate.

4,401,750
ETCHED PHOTOGRAPHIC IMAGERY

Jerrold Goldberg, 1313 N. 84th Pl., Scottsdale, Ariz. 85257

Filed Nov. 16, 1981, Ser. No. 321,768
Int. Cl.³ G03C 5/00
U.S. Cl. 430—323 16 Claims

1. A method of producing photographic-print-quality image reproductions with a range of image contrast gradations throughout by etching comprising the steps of:

selecting a base material having a surface suitable for etching;

coating the etchable surface of the selected base material with photo resist;

projecting light onto said photo resist coating by passing the light through a film photographic image selected to have sufficient image granularity to produce a comparatively coarse grained latent image in said photo resist coating relative to fine grain standards of the photographic arts;

treating said photo resist coating to remove from the etchable surface of the selected base material all such photo resist except such as provides the desired etchant resistant latent image; and

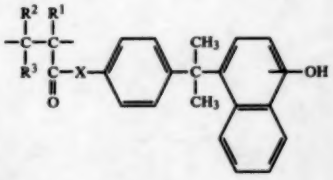
etching the etchable surface of said selected material to produce an etched photographic image on said etchable surface which image displays a range of image contrast dependent upon the degree of image granularity of the film photographic image utilized in first exposing said photo resist coating to light.

4,401,751
SILVER SALT EMULSION, PHOTOGRAPHIC MATERIAL AND PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES

Edith Weyde, Kuerten; Harald von Rintelen, Leverkusen; Wilhelm Saleck, Bergisch Gladbach, and Heinz-Horst Teitscheid, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,221
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037384
Int. Cl.³ G03C 5/26, 5/24
U.S. Cl. 430—375 12 Claims

1. A light-sensitive emulsion containing a silver salt capable of forming a catalyst for decomposition of a peroxide compound and in an amount in the range of from 1 to 800 mg/m² of the emulsion and having an average grain size of at the most 0.3 μm characterized in that said emulsion contains a copolymer having from 0.1 to 20% by weight of recurrent structural units corresponding to the following formula:



(I)

wherein

X denotes —O— or —NH—,

R^1 denotes hydrogen or alkyl with 1 to 4 C-atoms,

R^2 denotes hydrogen or alkyl with 1 to 4 C-atoms,

R^3 denotes hydrogen, —COOH or $COOR^4$, and

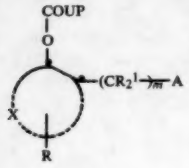
R^4 denotes alkyl with 1 to 8 C-atoms or cycloalkyl in an amount capable of reducing fog and increasing speed.

4,401,752
ARYLOXY SUBSTITUTED PHOTOGRAPHIC COUPLERS AND PHOTOGRAPHIC ELEMENTS AND PROCESSES EMPLOYING SAME

Philip T. S. Lau, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,237
Int. Cl.³ G03C 7/00, 1/40
U.S. Cl. 430—385 **18 Claims**

10. A process of developing an image in a photographic element comprising a support and a silver halide emulsion containing an imagewise distribution of developable silver halide grains, the process comprising the step of developing the element with a silver halide color developing agent in the presence of a dye-forming coupler having the structure:



where:

COUP represents a dye-forming coupler moiety substituted in its coupling position with the remainder of the structure;

X represents the atoms to complete a phenyl nucleus free of groups which are capable of undergoing coupling;

R is hydrogen or one or more substituents selected from the group consisting of halogen, alkyl, alkoxy, nitro, cyano, carboxy, alkoxycarbonyl, aryloxycarbonyl, alkylsulfonyl, arylsulfonyl, amido, carbamoyl, sulfonamido and sulfamoyl;

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms;

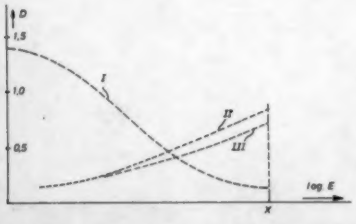
m is 0 to 4; and

A is a moiety containing a polarizable carbonyl, sulfonyl or phosphinyl group free of photographic dye groups and photographic reagent groups which are released during photographic processing.

4,401,753
PHOTOGRAPHIC SILVER HALIDE MATERIAL FOR USE IN THE SILVER COMPLEX DIFFUSION TRANSFER REVERSAL PROCESS WITH TWO SILVER HALIDE LAYERS

Jos A. Vaes, Betekom, and Jozef P. De Prijcker, Hamme, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 10, 1982, Ser. No. 376,664
Claims priority, application United Kingdom, May 12, 1981, 8114428
Int. Cl.³ G03C 5/54, 1/48, 1/76
U.S. Cl. 430—502 **10 Claims**



1. A photographic material containing a transparent support coated at each side with a negative working silver halide emulsion layer (A) and (B) respectively, characterized in that the silver halide in each of the silver halide emulsion layers contains more than 50 mole % silver chloride, wherein

(1) the silver halide in layer (A) is in operative relationship with a mixture of developing agents comprising an o-dihydroxybenzene and a 3-pyrazolidinone, the molar amount of the o-dihydroxybenzene in said mixture being larger than that of the 3-pyrazolidinone, and said silver halide emulsion layer (A) is capable of yielding by exposure and DTR-processing under alkaline aqueous conditions in the presence of a silver complexing agent while in contact with a separate image-receiving material containing developing nuclei, a positive transfer image in said image-receiving material having a maximum density of at least 1.4 and having a gamma value in the range of 0.9 to 1.8,

(2) the silver halide in layer (B) is in operative relationship with one or more silver halide developing agents by means of which by processing under alkaline aqueous conditions in the presence of a silver complexing agent a negative silver image is simultaneously obtainable in said layer (B) having a density at least 1.3 times as high as that of the negative silver image formed by said DTR-processing in layer (A), said densities being determined at the log E value X at which in the positive transfer image formed in said processing a density 0.01 above fog is obtained, and

(3) said photographic material by exposure through a grey wedge and by said processing is capable of yielding in each of the said silver halide emulsion layers (A) and (B) a negative silver wedge image the combined density of which, determined at the said log E value X, is at least 0.8 and whose average gradient between optical density values 0.1 and 0.8 above fog is in the range 0.5 to 1.0.

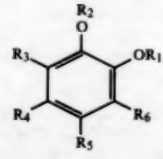
4,401,754
SILVER HALIDE PHOTOGRAPHIC EMULSION

Akio Suzuki; Hiroaki Shiozawa; Takeo Koitabashi, and Hideki Takiguchi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,566
Claims priority, application Japan, Nov. 11, 1980, 55-158991
Int. Cl.³ G03C 1/28, 1/34
U.S. Cl. 430—599 **18 Claims**

1. A silver halide photographic emulsion characterized in that it comprises silver halide grains reduction-sensitized in a process of growing the silver halide grains, and a compound represented by the following General Formula [I]:

General Formula [I]



(wherein R_1 and R_2 are selected from the group consisting of a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an acyl group and a cycloalkyl group and R_3, R_4, R_5 and R_6 are selected from the group consisting of a hydrogen atom, a halogen atom, a hydroxy group, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, an alkoxy group, an acyl group, a carboxyl group, an aldehyde group, an amino group, a sulfo group, an alkylthio group, an acylamino group, an aryloxy group, an arylthio group, an alkylamino group, an alkoxycabonyl group and a sulfonamide group.)

4,401,755

PROCESS FOR MEASURING MICROBIOLOGICALLY ACTIVE MATERIAL

James C. Weaver, Sudbury, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 29, 1981, Ser. No. 229,483

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ C12Q 1/04, 1/18, 1/06; C12M 1/34

U.S. Cl. 435—34 25 Claims

1. The process of measuring the microbiological activity of a sample of a given material comprising the steps of:

(a) forming mutually independent samples of said material by

(i) forming a dilute suspension of said material in a liquid diluent capable of forming a gel upon subsequent treatment, said dilute suspension having a dilution selected so that there is provided a high probability that each microsample produced from said suspension contains one or less microbiologically active molecule or cell,

(ii) converting said suspension into gel droplets having a size between about 0.2 and 1000 microns, and

(b) measuring a product of microbiological activity of each of said gel droplets independently of the other of said droplets.

4,401,756

PROCESS FOR PREPARING HUMAN INTERLEUKIN 2

Steven Gillis, Woodinville, Wash., assignor to Immunex Corporation, Seattle, Wash.

Filed Apr. 14, 1981, Ser. No. 249,905

Int. Cl.³ C12P 21/00; C12N 5/00, 5/02; C12R 1/91

U.S. Cl. 435—68 14 Claims

1. A process for the production of IL-2 from a malignant human T-cell line that is capable of producing IL-2, comprising culturing malignant human T-cells that are capable of producing IL-2 in a culture medium containing a T-cell mitogen and recovering the IL-2 from the culture medium.

4,401,757

SEMI-SYNTHESIS OF HUMAN INSULIN

Kazuyuki Morihara; Tatsushi Oka, both of Osaka; Masami Soejima, Tsuchiura, and Takeharu Masaki, Ibaraki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 138,513, Apr. 9, 1980, Pat. No. 4,320,197. This application Dec. 31, 1981, Ser. No. 336,072

Claims priority, application Japan, Apr. 13, 1979, 54-45711

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ C12P 21/04; C12R 1/025

U.S. Cl. 435—71 16 Claims

1. A process for preparing a B30-threonine-insulin which comprises converting an animal insulin to a des-B30-insulin, reacting the des-B30-insulin with a threonine derivative of the formula

$$Thr(R^1)(R^2)$$

wherein Thr is an L-threonine residue, R^1 is hydrogen or a hydroxy-protecting group and R^2 is a carboxyl-protecting group, in a molar ratio of the threonine derivative to the des-B30-insulin of 5:1 to 1000:1, and in the presence of an enzyme specifically acting on the lysine carbonyl in peptide bondings and produced by *Achromobacter lyticus M* 497-1, and subjecting the resultant product to one or more reactions to remove all of the protecting groups.

4,401,758

PROCESS FOR MAKING OLIGOSACCHARIDES HAVING ANTI-XA ACTIVITY AND THE RESULTING OLIGOSACCHARIDES

Jean-Claude Lormeau, Maromme La Maine; Jean Choay, and Maurice Petitou, both of Paris, all of France, assignors to Choay S.A., Paris, France

Continuation-in-part of Ser. No. 91,164, Nov. 5, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,544

Claims priority, application United Kingdom, Oct. 5, 1979, 7934673; Jan. 7, 1980, 8000443; Jul. 2, 1980, 8021749; Jul. 2, 1980, 8021750; Sep. 15, 1980, 8029697

Int. Cl.³ C12P 19/26; C08B 37/10; C07H 5/06

U.S. Cl. 435—84 15 Claims

1. A process for obtaining oligosaccharides and oligosaccharide fractions having activity against activated factor X of blood, as determined by the Yin-Wessler titer, (anti-Xa activity) comprising the steps of:

contacting heparin or a heparin fraction possessing anticoagulant activity and comprised of polysaccharide chains of molecular weight ranging from about 2,000 to about 50,000, with an agent capable of depolymerizing or fragmenting the heparin polysaccharide chains, under conditions adjusted to obtain a mixture which contains an oligosaccharide fraction of reduced molecular weight composed of fragments or chains constituted by no more than 8 saccharide moieties having said anti-Xa activity and including a sequence of less than 8 saccharide moieties, which sequence has binding affinity for AT III (antithrombin III) and is responsible for the specific anti-Xa activity of said oligosaccharide fraction,

separating at least the major part of said oligosaccharide fraction by (a) contacting the mixture with AT III to retain at least the major part of said oligosaccharide fraction having said anti-Xa activity and the binding affinity for AT III, (b) eliminating from the mixture the material not retained by AT III and (c) separating said oligosaccharide fraction from said AT III.

5. A process according to claim 1 wherein heparin is depolymerized by an enzymatic process which cleaves the heparinic chain between the anomeric carbon of an N-sulfate glucosamine residue and the following uronic acid unit.

4,401,759

DETECTION AND ISOLATION OF GLUCAGON MRNA USING A SYNTHETIC OLIGODEOXYNUCLEOTIDE

Harvey Rubin, 2560 First Ave., San Diego, Calif. 92103, and Richard H. Tullis, 11180 Roselle St., San Diego, Calif. 92121

Continuation-in-part of Ser. No. 145,448, May 1, 1980, abandoned. This application Apr. 8, 1982, Ser. No. 366,593

Int. Cl.³ C12Q 1/68; C12P 19/34, 21/00; C12N 15/00

U.S. Cl. 435—91 5 Claims

1. The method of isolating glucagon mRNA from human and rabbit pancreas which comprises the steps of:

extracting total RNA from rabbit or human pancreas;

isolating mRNA-poly A from said total RNA; and

hybridizing said mRNA-poly A with a 14 base oligodeoxynucleotide dTTCATCAGCCACTG, wherein A represents adenine, T represents thymine, G represents guanine and C represents cytosine, and wherein at least 13 of the 14 nucleotides are as indicated.

4,401,760

HETEROPOLYSACCHARIDE S-194

Jerry A. Pelk, San Diego; Suzanna M. Steenbergen, Lakeside, and Harold R. Hayden, Escondido, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 21, 1981, Ser. No. 313,440

Int. Cl.³ C12P 19/04; C12N 1/20; C12R 1/05

U.S. Cl. 435—101 7 Claims

2. A culture consisting essentially of Alcaligenes microorganism, ATCC 31961, said culture being capable of producing

heteropolysaccharide S-194 in recoverable amounts by submerged, aerobic fermentation of an assimilable carbon source.

4,401,761

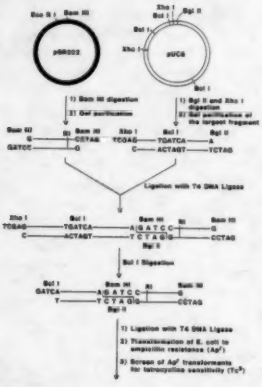
PROCESS FOR STABILIZING PLASMIDS BY DELETION OF DNA

Jack J. Manis, Portage, and Sarah K. Highlander, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 228,240, Jan. 26, 1981, Pat. No. 4,338,400. This application Feb. 25, 1982, Ser. No. 352,499

Int. Cl.³ C12N *15/00*; C12P *21/02, 21/00*; C12N *1/20, 1/00*

U.S. Cl. 435—172 1 Claim



1. A process for stabilizing an unstable dual plasmid comprising the genomes of plasmids pBR322 and pUC6 which comprises deleting a region identified as located within the 2.4 kb pUC6 fragment between the Pvu 11 site at 6.2 kb and the Bcl 1 site at 3.8 kb.

4,401,762

PROCESS OF CULTURING MICROORGANISMS USING A MICROEMULSION

Jacques Tellier, Lons; Andre Sirvins, Pau; Jean-Claude Gautier, and Bernard Tramier, both of Billere, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Sep. 17, 1981, Ser. No. 302,961

Claims priority, application France, Sep. 19, 1980, 80 20178; Sep. 1, 1981, 81 16626

Int. Cl.³ C12N *1/00*

U.S. Cl. 435—243 9 Claims

1. Process of culturing microorganisms in a hydrophobic medium with the use of nutrient substances in aqueous solution, comprising microemulsifying the aqueous solution in a liquid immiscible with water but miscible with the hydrophobic medium and introducing the microemulsion thus formed into the medium containing sources of the microorganisms to be cultured.

4,401,763

ANALYTICAL METHOD FOR THE DETERMINATION OF NITROGEN, CARBON, HYDROGEN AND SULFUR OR CHLORINE AND APPARATUS THEREFOR

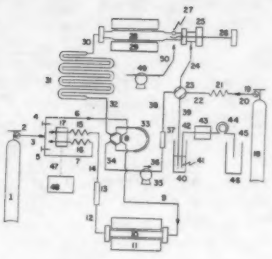
Tadamasa Itoh, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 5, 1981, Ser. No. 318,406

Claims priority, application Japan, Nov. 13, 1980, 55-160418

Int. Cl.³ G01N *31/12*

U.S. Cl. 436—115 13 Claims



1. A method for elementary analysis by independent or simultaneous determination of any number of elements from the group consisting of nitrogen, carbon, and hydrogen and at least one element of sulfur or chlorine in samples, comprising:

passing an oxygen gas through a combustion system in a reaction tube packed with an oxidation catalyst or oxidizing agent having a heating zone maintained at a temperature of from 800° C. to 1100° C.;

introducing a sample into said reaction tube with circulating oxygen in a closed system, said oxygen being present in an amount sufficient to thereby subject said sample to complete combustion and said circulating oxygen uniformalizing the resulting combustion gas by continuous circulation during combustion to achieve a homogeneous combustion gas mixture;

dividing the homogeneous combustion gas mixture into first and second combustion portions in a definite volume ratio;

introducing said first combustion portion, together with a carrier gas, into a reduction tube packed with reduced copper having a heating zone maintained at a temperature of from 400° C. to 700° C., and detecting and determining the resulting nitrogen gas, carbon dioxide gas and steam or acetylene gas or hydrogen gas produced by contacting steam with calcium carbide or calcium hydride; while

introducing sulfur oxide or chlorine and/or hydrogen chloride gas contained in said second combustion mixture into an absorption liquor together with oxygen gas; and

detecting and determining at least one of the resulting sulfate or chloride ion.

4,401,764

IMMUNOASSAYS EMPLOYING LABELED REAGENT AND A CONJUGATE HAVING TWO BINDING SITES

David S. Smith, London, England, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,477

Claims priority, application United Kingdom, Feb. 7, 1980, 8004090

Int. Cl.³ G01N *33/48, 33/52, 33/54, 33/78*

U.S. Cl. 436—500 21 Claims

1. A method of immunoassay of an antigen in a liquid sample, which comprises forming a mixture of:

(a) sample;

(b) a substance bearing a non-radioisotopic label, which substance is the same as the antigen under assay or is so closely similar as to be bindable by an antibody against the antigen; and

(c) a mixed binding conjugate which comprises at least one first site selectively bindable to the antigen, and at least one second site selectively bindable to the label, the first and second sites being spaced apart so that a single molecule of labelled substance cannot simultaneously become bound to both a first and a second site, and wherein the activity of the label is changed upon binding to the second site; and detecting the amount of label activity in the mixture and therefrom determining the amount of antigen.

2. The method of claim 1 wherein the label is a fluorophore or a potential fluorophore, and the activity is fluorescence.

4,401,765
COVALENTLY BONDED HIGH REFRACTIVE INDEX PARTICLE REAGENTS AND THEIR USE IN LIGHT SCATTERING IMMUNOASSAYS

Alan R. Craig; William A. Frey; Charles C. Leflar; Catharine E. Looney, all of Wilmington, Del., and Michael A. Luddy, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 298,473, Sep. 1, 1981, abandoned. This application Oct. 28, 1981, Ser. No. 315,922
Int. Cl.³ G01N *33/54*
U.S. Cl. 436—533 **15 Claims**

1. A particle reagent having high refractive index consisting essentially of:

(A) a polymer particle having an inner core and an outer shell wherein the inner core is a polymer having a refractive index of not less than 1.54 as measured at the wavelength of the sodium D line and wherein the outer shell is a polymer of

(1) an ethylenically unsaturated monomer having a functional group capable of reacting with a compound of biological interest selected from the group consisting of epoxy, carboxyl, amino, hydroxyl and aldehyde,

(2) optionally, other ethylencially unsaturated monomers in an amount sufficient to produce water insoluble polymer particles, and

(3) not more than 10 parts by weight of the outer shell of the monomers of the inner core, said outer shell being formed by polymerization in the presence of said inner core; and

wherein said polymer particle has an approximate diameter range of 0.03–0.1 μm and is covalently attached to

(B) a compound of biological interest or its antibody.

4,401,766
CERAMIC SEAL BETWEEN SPACED MEMBERS SUCH AS A TERMINAL PIN AND A FERRULE

James C. Kyle, 610 Woodwillow St., Roseburg, Oreg. 97470, assignor to James C. Kyle, Roseburg, Oreg.

Division of Ser. No. 836,659, Sep. 26, 1977, Pat. No. 4,352,951. This application Apr. 27, 1982, Ser. No. 372,117
Int. Cl.³ C03C *3/10, 7/02, 7/04*
U.S. Cl. 501—15 **19 Claims**

1. In an electrical insulating material having properties of producing a hermetic seal, the combination of the following materials in the following range of percentages by weight:

Material	Range of Relative Percentages by Weight
Lead oxide (PbO)	28–32
Silicon dioxide (SiO_2)	38–42
Boric oxide (B_2O_3)	2–4
Aluminum oxide (Al_2O_3)	1–2
Manganese oxide (MnO)	6–11
Sodium oxide (Na_2O)	13–16

7. The combination set forth in claim 1 wherein the insulating material is partially amorphous and partially crystalline and has the properties of providing a hermetic seal through more than one reheating in an oxygen atmosphere at a temperature of approximately 1500° F. to

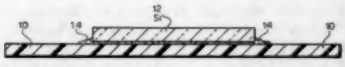
MATERIAL	RANGE OF PERCENTAGE BY WEIGHT
LEAD OXIDE (PbO)	28–32
SILICON DIOXIDE (SiO_2)	38–42
ALUMINUM OXIDE	1–2
BARIC OXIDE	2–4
MANGANESE OXIDE	6–11
SILICON DIOXIDE	38–42
APPROVED	
AT LEAST ONE MEMBER SELECTED FROM THE GROUP CONSISTING OF COBALT OXIDE, NICKEL OXIDE, CHROMIUM OXIDE, COPPER OXIDE AND VANADIUM OXIDE	1.5–5
MOLYBDIC OXIDE	0.5–5
AT LEAST ONE MATERIAL SELECTED FROM THE GROUP CONSISTING OF ZIRCONIUM SILICATE, ZIRCONIUM SILICATE AND ZINC ZIRCONIUM SILICATE	3–12

1600° F. for a period of time to approximately thirty (30) minutes.

4,401,767
SILVER-FILLED GLASS

Raymond L. Dietz, Poway; Michael Featherby, San Diego, and Peter K. Margetts, El Cajon, all of Calif., assignors to Johnson Matthey Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 287,897, Aug. 3, 1981, abandoned. This application Mar. 8, 1982, Ser. No. 355,719
Int. Cl.³ B22F *7/02*; C03C *3/10*; H05K *7/06*; H01L *23/10*
U.S. Cl. 501—19 **6 Claims**



1. A silver-filled glass metallizing paste adapted for bonding semiconductive devices to ceramic substrates consisting essentially of:

25 to 95% of silver powder having a surface area of about 0.2 to 1.0 m^2/gm and a tap density of about 2.2 to 2.8 gm/cc;

75 to 5% of a high-lead, borosilicate substantially sodium-free glass frit having a softening temperature in the range of 325° to 425° C., a coefficient of thermal expansion no higher than about 13 ppm/°C., a surface area in the range of about 0.3 to 0.6 m^2/gm, and a tap density in the range of about 2.8 to 3.6 gm/cc; and

a suitable liquid organic vehicle in an amount sufficient to establish the percent solids in said paste in the range of about 75 to 85%.

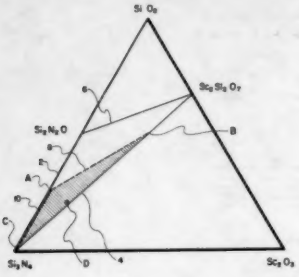
4,401,768
Si_3N_4CERAMIC DENSIFIED USING SC_2O_3 AND SiO_2

Peter E. D. Morgan, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 15, 1982, Ser. No. 357,949
Int. Cl.³ C04B *35/58*
U.S. Cl. 501—98 **3 Claims**

1. A ceramic having good oxidation and creep resistance at 1400° C., said ceramic having a composition within the following tie lines in the ternary phase diagram:

Si_3N_4-Si_2N_2O tie line;
Si_3N_4-$Sc_2Si_2O_7$ tie line;
$Sc_2Si_2O_7$-Si_2N_2O; and



containing more than 50 mole % Si_3N_4 and at least 0.5 mole % $Sc_2Si_2O_7$.

4,401,769

FOAM, COMPOSITION AND METHOD USEFUL FOR RETROFIT INSULATION

Nelson Malwitz, Brookfield, Conn., assignor to Sealed Air Corporation, Fairlawn, N.J.

Filed Jun. 23, 1982, Ser. No. 391,007
Int. Cl.³ C08G *18/14*; C08J *9/00*; B29C *27/00*
U.S. Cl. 521—113 **56 Claims**

1. A rigid closed cell foam made from the reaction of foam forming reactants comprising a multi-functional isocyanate selected from diphenylmethane diisocyanate, prepolymers of diphenyl methane diisocyanate, and mixtures thereof; water; and a catalytic amount of an isocyanate polymerizing catalyst; wherein said foam is formed in the presence of a softening agent selected from the group consisting of a chlorinated alkane, brominated alkane, alkyl ester of an alkanoic acid, alkylene oxide, aromatic hydrocarbon, acylnitrile, aliphatic ketone, aliphatic aldehyde, aliphatic ether, cyclic ether, amide of an alkanoic acid and mixtures thereof; and wherein said water and said softening agent are present in amounts effective to provide a gel time which exceeds the rise time of the foam.

4,401,770

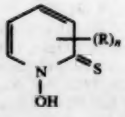
SHOE INSOLE HAVING ANTIBACTERIAL AND ANTIFUNGAL PROPERTIES

James C. Hance, New Canaan, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 1, 1982, Ser. No. 364,551
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—120 **20 Claims**

1. A shoe insole having antibacterial and antifungal properties comprising a flexible polyurethane foam prepared from a reaction mixture, comprising a polyol, an organic polyisocyanate, a foaming agent, a reaction catalyst and an effective antibacterial and antifungal proportion of a pyridinethione compound selected from the group consisting of:

(a) 1-hydroxy-2(1H)-pyridinethione compounds having the formula



wherein R represents a member of the group consisting of hydrogen, lower alkyl, lower alkoxy and halo, and n is a positive integer less than 5; and the following salts thereof: alkali metal, alkaline earth metal, aluminum, heavy metal, amine-addition and quarternary ammonium;

(b) 2,2'-dithiobis-pyridine-1,1'-dioxide; and

(c) adducts of 2,2'-dithiobis-pyridine-1,1'-dioxide, said adducts having the formula

$$(C_5H_4NOS)_2MY_t$$

wherein M is an alkaline earth metal selected from the group consisting of calcium, magnesium, barium and strontium, Y is an anion selected from the group consisting of halides, sulfates, nitrates, chlorates and acetates, and t is either 1 or 2.

4,401,771

METHOD FOR PREPARING POLYESTER FOAM USING COBALT/POTASSIUM PROMOTORS

James Ahnemiller, Middlebury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,517
Int. Cl.³ C08J *9/10*
U.S. Cl. 521—121 **8 Claims**

1. A foamable and simultaneously curable polyester composition consisting essentially of, all parts being by weight:

(a) 100 parts liquid unsaturated polyester resin,

(b) 0.5 to 10 parts monosubstituted sulfonyl hydrazide having the formula RSO_2NHNH_2, wherein R is C_1–C_{12} alkyl, C_5–C_6 cycloalkyl, C_7–C_{10} aralkyl, phenyl, naphthyl, or phenyl substituted with halogen, C_1–C_{12} alkyl or C_1–C_{12} alkoxy,

(c) 0.1 to 5.0 parts of a promoter, said promoter consisting essentially of a mixture of organic heavy metal salt and organic alkali metal salt, wherein the heavy metal/alkali metal molar ratio is from 10/1 to 1/10,

(d) 0 to 2 parts surfactant,

(e) 0 to 250 parts of filler, and

(f) 0.3 to 5 parts of a cross-linking initiating compound selected from organic peroxides and organic hydroperoxide.

4,401,772

METHYL GLUCOSIDE-AMINE-BASED POLYETHER POLYOLS AND POLYURETHANE FOAMS PREPARED THEREFROM

Stephen Fuzesi, Hamden, and John G. Bayusik, Wallingford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 218,871, Dec. 22, 1980, Pat. No. 4,359,573.
This application Apr. 15, 1982, Ser. No. 368,614
Int. Cl.³ C08G *18/14, 18/50*
U.S. Cl. 521—167 **13 Claims**

1. In a polyurethane foam comprised of the reaction product of a polyol reactant, an organic polyisocyanate reactant, a reaction catalyst and a foaming agent, the improvement wherein said polyol reactant is prepared by:

a. forming a crude methyl glucoside reaction product by reaction in the presence of a catalytic proportion of an acid catalyst,

(1) starch and

(2) methanol, said reaction being carried out at an elevated pressure and by reacting at least a stoichiometric proportion of said methanol with said starch, and

b. admixing said crude methyl glucoside reaction product with an amine in the presence of a basic catalyst, maintaining said mixture at a temperature of from 100° to 165° C., and introducing into said mixture an alkylene oxide having between 2 and about 6 carbon atoms, said amine being employed in an amount of at least about 0.1 mole to about 10 moles per glucose unit weight of starch and being selected from the group consisting of an aliphtic amine having 1–8 carbon atoms, an aromatic primary amine having 6–8 carbon atoms, an alkanolamine in which each

alkanol group contains 2–5 carbon atoms, and a mixture thereof.

4,401,773

HIGHLY REACTIVE ION-LEACHABLE GLASS

Harold T. Smyth, East Brunswick, N.J., assignor to Johnson and Johnson, New Brunswick, N.J.

Filed Nov. 7, 1980, Ser. No. 203,761
Int. Cl.³ C08K 3/40; A61K 5/00
U.S. Cl. 523—116 2 Claims

1. A cementitious composition comprising:

an ion-leachable inorganic component comprising ground glass having a degree of crystallinity of less than about 1% by weight of the crystalline form, and a proton donating compound.

4,401,774

THERMOSETTING RESINOUS BINDER COMPOSITIONS, THEIR PREPARATION, AND USE AS COATING MATERIALS

Petrus G. Kooymans; Johannes J. M. H. Wintraecken; Werner T. Raudenbusch; Josepha M. E. Seelen-Kruijssen, and Gerardus C. M. Schreurs, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 99,363, Dec. 3, 1979, Pat. No. 4,332,711.
This application Feb. 16, 1982, Ser. No. 349,294
Claims priority, application Netherlands, Dec. 11, 1978, 7812028
Int. Cl.³ C08K 3/20, 63/00
U.S. Cl. 523—402 15 Claims

1. A thermosetting binder composition, heat curable to given an insoluble infusible coating comprising

(I) a precondensate prepared by mixing and reacting from about 100° C. to about 170° C.

(1) from about 50 to 90 parts by weight of a non-acidic resinous compound essentially free of ethylenically unsaturation, having a molecular weight of at least 900 and a hydroxyl content of at least 0.2 equivalent per 100 g, and

(2) from about 10 to 50 parts by weight of a non-acidic polyester having a acid number of not more then 10 of a polycarboxylic acid crosslinking agent having more than one β-hydroxyl ester group per molecule, at least one of the components (1) and (2) having a hydroxyl functionality of more than 2, and

(II) a transesterification-promoting metal salt or metal complex curing catalyst which is soluble in liquid hydrocarbons.

4,401,775

EPOXY ENCAPSULATING FORMULATION

Thomas R. Pampalone, Branchville, N.J., and Sidney S. Seffren, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,923
Int. Cl.³ C08L 63/00
U.S. Cl. 523—403 8 Claims

1. An encapsulating composition suitable for the encapsulation of wire coils comprising 1:1 stoichiometric amounts of:

(a) an epoxy resin component comprising from about 40 to about 80 percent by weight of a liquid bisphenol A resin and from about 20 to about 60 percent by weight of a liquid cycloaliphatic epoxy resin; and

(b) a hardener component comprising from about 70 to about 90 percent by weight of dodecyl succinic anhydride and from about 10 to about 30 percent by weight of the maleic anhydride adduct of methylcyclopentadiene.

4,401,776

POURABLE SOLID MIXTURE

Kurt Munk, Grenzach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,198
Claims priority, application Switzerland, Jul. 15, 1980, 5414/80
Int. Cl.³ C08L 63/00, 67/06, 61/06
U.S. Cl. 523—443 12 Claims

1. A pourable, solid mixture which contains, based on the total mixture,

(a) 49.75 to 7.5% by weight of a liquid synthetic resin which is an epoxide resin, unsaturated polyester resin, polyurethane resin, phenol/formaldehyde resin, urea/formaldehyde resin, melamine/formaldehyde resin, oil-modified alkyd resin, polysilicone or unsaturated polyimide,

(b) 50 to 87.5% by weight of a mineral filler, and

(c) 0.25 to 5% by weight of a crystalline synthetic calcium silicate, which can be in diverse stages of hydration and has a high length/width ratio and a width dimension of less than 1 μm.

4,401,777

CURABLE RESIN COMPOSITION COMPRISING N-(ALKENYLPHENYL)MALEIMIDE AND EPOXY COMPOSITION

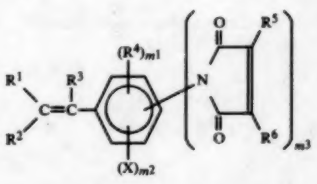
Hikotada Tsuboi; Motoo Kawamata; Masayuki Oba, and Nobuhito Koga, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 312,959
Int. Cl.³ C08G 59/18, 59/44, 73/12
U.S. Cl. 523—451 28 Claims

1. A curable resin composition comprising:

(a) at least one N-(alkenylphenyl)maleimide represented by the general formula (I):

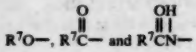
(I)



wherein R^1–R^6 are the same or different from one another and denote independently hydrogen, a hydrocarbon group having 1–20 carbon atoms, a halogen, R^7O- or

group, where R^7 represents a hydrocarbon group having 1–20 carbon atoms or a hydrocarbon group having 1–20 carbon atoms and substituted by one or more halogen atoms, hydroxyl group, cyano group, or a hydrocarbon group substituted by one or more halogens, R^7O- or

group(where R^7 is as defined above), hydroxyl group or cyano group and having 1–20 carbon atoms prior to the substitution, a plurality of R^4s are the same or different when m^1 stands for a value of 2 or greater, R^3 is coupled with either R^1 or R^2, thereby forming a ring, X denotes at least one atom or group selected from hydrogen, halogens, hydroxyl group,



groups, where R^7 is as defined above, cyano group, nitro group or carboxyl group, a plurality of Xs are the same or different when m^2 stands for a value of 2 or greater, and m^1, m^2 and m^3 represent independently a positive integer and $m^1+m^2+m^3=5$, dimers of said maleimides and polymers of said maleimides having a polymerization degree of at least 3; and

(b) at least one epoxy compound, each having at least one 1,2-epoxy group in the unit molecule thereof.

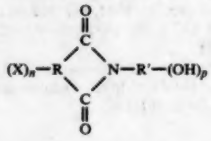
4,401,778

FLAME RETARDANT THERMOPLASTIC COMPOSITIONS

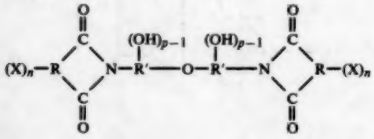
Henry J. Barda, North Brunswick, and Joseph M. Lesniewski, Hopewell, both of N.J., assignors to Saytech, Inc., Sayreville, N.J.

Filed Sep. 17, 1981, Ser. No. 303,159
Int. Cl.³ C08K 5/34
U.S. Cl. 524—89 **16 Claims**

1. A thermoplastic polymer containing a flame retardant amount of a flame retardant additive mixture, said flame retardant additive mixture comprising halogenated imide-containing polyol having the formula:

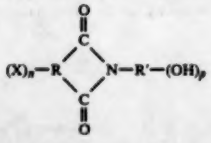


and the corresponding ethers having the formula:



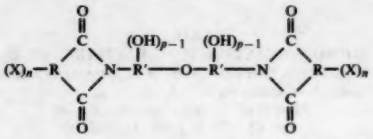
wherein R is a hydrocarbon group having the valence n+2 and is selected from the group consisting of benzene groups, naphthalene groups and alicyclic hydrocarbon groups containing 5 to 10 carbon atoms, R′ is an aliphatic hydrocarbon group containing 3–12 carbon atoms, X is selected from the group consisting of bromine and chlorine, n is an integer from 1–6 and p is an integer from 2–6.

7. A flame retardant thermoplastic polymer containing a flame retardant amount of a flame retardant additive having the formula:



wherein R is a benzene group, R′ is an aliphatic hydrocarbon group containing 3–12 carbon atoms, X is selected from the group consisting of bromine and chlorine, n is an integer from 1–6 and p is an integer from 2–6.

11. A flame retardant thermoplastic polymer containing a flame retardant amount of flame retardant additive having the formula:



wherein R is a hydrocarbon group having the valence n+2 and is selected from the group consisting of benzene groups, naphthalene groups and alicyclic hydrocarbon groups containing 5 to 10 carbon atoms, R′ is an aliphatic hydrocarbon group containing 3–12 carbon atoms, X is selected from the group consisting of bromine and chlorine, n is an integer from 1–6 and p is an integer from 2–6.

4,401,779

HOMOGENEOUS LIQUID BARIUM CARBONATE-BARIUM ALKYL PHENATE-CADMIUM CARBOXYLATE STABILIZER SYSTEMS FOR RIGID POLYVINYL CHLORIDE RESINS

Kook J. Bae, East Northport, and Lawrence R. Brecker, Brooklyn, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

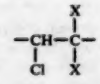
Filed Dec. 31, 1981, Ser. No. 336,126
Int. Cl.³ C08K 5/15, 5/13
U.S. Cl. 524—114 **24 Claims**

1. A homogeneous liquid stabilizer system imparting heat and light stability to polyvinyl chloride resins and which is substantially solvent-free and has a low viscosity and a minimum flash point of 96° C., consisting as the essential and only stabilizers of

(1) a liquid barium carbonate-barium alkyl phenate and

(2) a cadmium salt of a carboxylic acid selected from the group consisting of branched chain aliphatic carboxylic acids having from about eight to about ten carbon atoms, and mixtures thereof in an amount of at least about 85% with up to about 15% of one or more cadmium salts of aromatic carboxylic acids having from about seven to about eleven carbon atoms, and saturated and unsaturated straight chain aliphatic carboxylic acids having from about twelve to about twenty-two carbon atoms, the total weight preferred of barium and cadmium in the stabilizer system being at least 18%, and the ratio of the weight percent of cadmium to the weight percent of barium being within the range from about 0.4:1 to about 1.2:1, the barium and cadmium salts being in amounts to form a homogeneous liquid.

19. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group:



and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and an amount to enhance the resistance to deterioration of the resin of a stabilizer composition according to claim 1.

4,401,780

TEXTILE TREATMENTS

Cynthia L. Steel, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1982, Ser. No. 345,409
Int. Cl.³ C08K 5/20, 5/29
U.S. Cl. 524—225 15 Claims

1. Fluorochemical compositions comprising a mixture of:
(a) water-insoluble fluoroaliphatic radical- and aliphatic chlorine-containing ester;
(b) water-insoluble fluoroaliphatic radical-containing polymer, and
(c) water-insoluble fluoroaliphatic radical-containing compounds selected from carbonylimino compounds and imine compounds.

4,401,781

LUBRICATIVE, OILY, CROSS-LINKED RESIN COMPOSITION

Junnosuke Yoshifuji, Takarazuka, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Continuation of Ser. No. 251,061, Apr. 6, 1981, abandoned. This application Sep. 3, 1982, Ser. No. 414,825
Int. Cl.³ C08K 5/54
U.S. Cl. 524—261 16 Claims

1. A lubricative, oily, cross-linked resin composition suitable for use as a frictional sliding layer or element, which comprises 100 parts by weight of a cross-linked polyethylene, and 1 to 300 parts by weight of a glycol lubricating oil impregnated in the cross-linked polyethylene.

4,401,782

HOT MELT SIZE AND YARNS SIZED THEREWITH

Delano M. Conklin, Burlington; John H. Hansen, and John B. Hodgin, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 257,315, Apr. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 147,335, May 6, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,865
Int. Cl.³ C08L 23/08; D06M 15/16; D06L 1/06
U.S. Cl. 524—313 18 Claims

1. A quick-setting, non-aqueous, water-extractable textile melt size composition comprising an intimate mixture of about 42 to about 58 weight percent of substantially 80/20 ethylene/acrylic acid copolymer, about 58 to about 42 weight percent of a wax derived by full hydrogenation of animal and plant tallows and oils, excluding castor wax, said size capable of being applied as a melt to textile yarns, with quick setting when exposed to ambient conditions, and capable of being removed from the yarns by aqueous or alkali extraction.

4,401,783

FLAME RETARDANT ELASTOMERIC COMPOSITIONS AND ARTICLES USING SAME

Vijayraj M. Kotian, Stow, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 26, 1982, Ser. No. 362,567
Int. Cl.³ C08K 3/10, 5/06, 5/09, 5/02
U.S. Cl. 524—371 20 Claims

1. A flame retardant thermoplastic elastomeric composition containing an elastomeric component and a non-elastomeric component; said elastomeric component in molded form having a durometer of from about 70 Shore A to about 50 Shore D and made from a blend of the type comprising about 25 to about 75 parts by weight of crystalline thermoplastic olefin resin and about 75 to about 25 parts by weight of fully vulcanized monoolefin copolymer rubber, said rubber being a polymer of monomers comprising ethylene or propylene and at least one other alpha olefin of the formula $CH_2{=}CHR$ in which R is an alkyl of 1 to 12 carbon atoms, and from none to a minor portion of at least one copolymerizable diene, and being sufficiently small dispersed particles vulcanized to the extent that the blend has a tensile strength of at least about 60 kg/cm^2. greater than that of the unvulcanized blend, said non-elastopmeric component comprising;
(a) from about 20 parts to about 40 parts by weight of a flame retardant compound selected from the group consisting of chlorinated brominated and chlorobrominated compounds and mixtures thereof per 100 parts by weight of said elastomeric component, said compounds having a halogen content of about 50% to about 85% by weight to the total weight of said compound;
(b) from about 5 parts to about 20 parts by weight of antimony oxide per 100 parts by weight of said elastomeric component, and
(c) from about 0.01 parts to about 8 parts by weight of a lead stabilizer selected from the group consisting of lead oxide, lead stearate, lead fumarate, and lead phthalate stabilizers and mixtures thereof per 100 parts by weight of said elastomeric component, and said composition having ASTM D 2863 limiting oxygen index of from about 24 to about 27 percent and in the form of an insulative covering about an electrical conductor able to meet or exceed the flame test requirements of UL VW-1 and in the form of a jacket about an electrical cable able to meet or exceed the cable flame test requirements of IEEE-383.

4,401,784

THERMOPLASTIC MOULDING COMPOSITION AND USE THEREOF

Franz Breitenfellner, Bensheim, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 20, 1982, Ser. No. 340,686
Claims priority, application Switzerland, Jan. 27, 1981, 512/81
Int. Cl.³ C08L 67/02
U.S. Cl. 524—424 4 Claims

1. A molding composition based on thermoplastic polyesters which consists of
(a) 40 to 99% by weight of a poly(alkylene terephthalate), and
(b) 1 to 60% by weight of dolomite; or
(c) 40 to 99% by weight of a poly(alkylene terephthalate), and
(d) 1 to 60% by weight of dolomite plus glass fibers, with all percentages by weight being based on the total composition.

4,401,785

POLYOLEFIN-POLY(ESTER-CARBONATE) COMPOSITION

Ping Y. Liu, Naperville, Ill., and Kenneth F. Miller, Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 29, 1982, Ser. No. 343,950
Int. Cl.³ C08K 3/40; C08G 63/64
U.S. Cl. 524—508 21 Claims

1. A thermoplastic molding composition which comprises:
(a) an aromatic polyester-carbonate containing carbonate groups, carboxylate groups and aromatic carbocyclic groups in the polymer chain, in which at least some of the carboxylate groups and at least some of the carbonate groups are bonded directly to ring carbon atoms of the aromatic carbocyclic groups; and
(b) a linear low density polyolefin having a density of about 0.89 to 0.96 gm/cc.

4,401,786

USE OF WATER SOLUBLE ELECTROLYTES AS ADDITIVES IN AQUEOUS DISPERSIONS OF SYNTHETIC MATERIALS AND AN AQUEOUS DISPERSION OF SYNTHETIC MATERIALS CONTAINING A WATER SOLUBLE ELECTROLYTE

Wolfgang Wenzel, Bergisch-Gladbach, and Walter Meckel, Neuss, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 7, 1980, Ser. No. 110,021

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900574

Int. Cl.³ C08L 75/06

U.S. Cl. 524—591 8 Claims

1. A stable aqueous dispersion of a polyurethane which yields films having superior water resistance and/or blocking resistance having chemically fixed anionic groups amounting to 1 to 50 milliequivalents per 100 g and not more than 1.0% by weight of ethylene oxide units chemically fixed within polyester chains, which dispersion has a solids content of from 5 to 65% by weight, characterized by containing 0.01 to 3.0% by weight, based on the solids content, of a water soluble organic or inorganic salt other than an external emulsifier.

4,401,787

LATEX COMPOSITIONS FOR WATER RESISTANT COATING APPLICATIONS

Tsang J. Chen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 7, 1981, Ser. No. 281,133

Int. Cl.³ C08L 67/02

U.S. Cl. 524—603 18 Claims

1. A latex composition, from which water resistant coatings can be prepared, comprising an aqueous continuous phase having dispersed therein loadable hydrophobic polyester particles characterized in that

(a) substantially all of the polyester particles are less than about 0.2 microns in diameter;

(b) the acid component of the polyester contains from about 0.5 to 5.0 mole percent dicarboxylic acid derived repeating units having a component selected from the group of salts consisting of alkali metal or ammonium iminodisulfonyl and alkali metal or ammonium sulfonate; and

(c) said latex contains from 0 to 3% surfactant based on the total weight of the polyester.

4,401,788

VINYLIDENE CHLORIDE COPOLYMER LATEX

Kazuhiko Hiyoshi, and Atsushi Sugizaki, both of Nobeoka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,327

Int. Cl.³ C08L 27/08

U.S. Cl. 524—714 8 Claims

1. A vinylidene chloride copolymer latex in the form of an aqueous dispersion of a copolymer resin, the copolymer resin predominantly comprising polymerized vinylidene chloride as the main component, the latex characterized by dispersed polymer particles having an average particle size of from about 1,300 to 2,000 Angstroms when measured by light scattering; the latex containing 0.05 to 0.5 percent by weight of an anionic surfactant and 3 to 5 percent by weight of a nonionic surfactant both on a polymer solids basis; and the latex having a Klaxon mechanical stability of 30 minutes or more when 2 percent by weight of a cationic surfactant is added to said latex on a polymer solids basis.

4,401,789

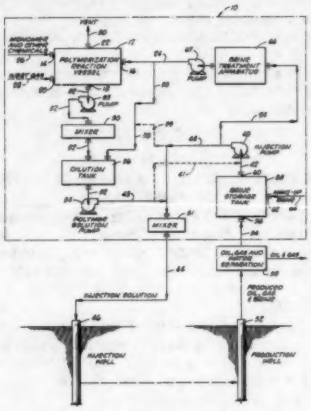
ENHANCED OIL RECOVERY METHODS AND SYSTEMS

Charles M. Gideon, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 14, 1981, Ser. No. 283,302

Int. Cl.³ C08L 33/26

U.S. Cl. 524—827 9 Claims



1. A method of preparing a viscous aqueous polymer solution having improved viscosity, stability and other properties for use in the treatment of subterranean hydrocarbon-containing formations comprising:

combining a buffer selected from the group consisting of sodium and potassium tetraborate, sodium, potassium and lithium tetraborate pentahydrate, sodium tetraborate decahydrate, dipotassium tetraborate tetrahydrate, potassium pentaborate tetrahydrate, disodium or dipotassium octaborate tetrahydrate, an aqueous solution of boric acid and sodium or potassium hydroxide and mixtures thereof with a substantially oxygen free aqueous solvent containing one or more metal salts;

combining one or more water-soluble polymerizable vinyl monomers with the resultant buffer-salt solution; and

combining a free radical polymerization initiator with the resultant monomer-buffer-salt solution to cause the polymerization of said monomers and the formation of a viscous aqueous polymer solution.

4,401,790

PROCESS FOR THE MANUFACTURE OF POLYVINYL ALCOHOL BY ALCOHOLYSIS OF A POLYVINYL ESTER

Hermann ter Jung, Kelkheim; Leonhard Reihs, Schwalbach, and Gerhard Roh, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,349

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026144

Int. Cl.³ C08F 8/12

U.S. Cl. 525—62 2 Claims

1. A process for the manufacture of polyvinyl alcohol by the alcoholysis of polyvinyl acetate in the presence of a basic catalyst and in the presence of an alkanol as solvent, which comprises first dissolving, in a reactor wherein the reactor used is a continuously working screw extruder, and further equipped with means for heating and cooling, a polyvinyl ester having a degree of polymerization of 400 to 10,000 (determined from the weight average of the molecular weight) in a lower alkanol, wherein the lower alkanol is an alkanol having 1 to 3 carbon atoms, the alkanol being employed in an amount of 20

to 40 percent by weight, relative to the polyvinyl ester, then mixing the resulting solution at a temperature of 30° to 60° C. with a solution of the catalyst wherein the catalyst is an alkali metal hydroxide or an alkali metal alcoholate in a lower alkanol, so as to form a homogeneous mixture, then warming the mixture to a temperature of 70° to 150° C. and, finally, cooling the resulting polyvinyl alcohol to a temperature of 20° to 40° C. and recovering the polyvinyl alcohol.

4,401,791

PROCESS FOR THE PREPARATION OF A MODIFIED HYDROCARBON RESIN

Kurt Hultzsch, and Albert Rudolphy, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 702,204, Jul. 2, 1976, Pat. No. 4,197,378, which is a continuation-in-part of Ser. No. 428,855, Dec. 27, 1973, abandoned. This application May 15, 1979, Ser. No. 39,399

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1972, 2264284

Int. Cl.[3] **C08L** *9/00, 25/02*

U.S. Cl. 525—132 **7 Claims**

1. A process for the preparation of a modified hydrocarbon resin free from indene suitable for use as a binder in a printing ink from a hydrocarbon resin (I) relatively unsuitable for use as a binder in a printing ink and having a melting point of at most 110° C. which comprises reacting in a first step a starting reactant of:

(I) at least one hydrocarbon resin based on hydrocarbon fractions containing:

(aa) from 20 to 100 percent by weight, referred to the total of polymerizable monomers, of olefinically unsaturated monomers with an average 5 C-atoms or

(bb) a combination thereof with 15 to 50 percent by weight, referred to the total of polymerizable monomers, of methylcyclopentadiene or

(Ia) a combination of at least one of (Iaa) and (Ibb) with 1 to 20 percent by weight, referred to the total of I, of at least one olefinically unsaturated monomer hydrocarbon having 2 to 12 carbon atoms selected from the group consisting of styrene, α- and β-methylstyrene, vinyltoluenes and a mixture of olefinically unsaturated hydrocarbons having 2 to 12 carbon atoms, the total amount of monomers always being 100% by weight, with

(II) 3 to 20% as much by weight of a dicarboxylic acid unit selected from the group consisting of

(IIa) an α-,β-olefinically unsaturated dicarboxylic acid and

(IIb) an equivalent amount of the corresponding dicarboxylic anhydride as defined in (IIa) and in a second step

(III) 1 to 100% as much by weight of a phenol component selected from the group consisting of

(III) (a) an unsubstituted or substituted by up to 3 hydrocarbon groups phenol aldehyde resin in which however the phenol component is at least bi-functional and

(III) (b) a mixture of a phenol and an aldehyde being the same as the starting materials phenol and aldehyde of (IIIa);

the portion of (I), (II), and (III) being correlated so that said modified hydrocarbon resin has a melting point of at least 120° C. and a viscosity in 50% toluene solution at 20° C. of at least 100 centipoise.

4,401,792

PROCESS FOR INCREASING THE RATE OF CRYSTALLIZATION OF POLYESTERS

Robert J. Axelrod, Glenmont, N.Y.; Frank N. Liberti, Mt. Vernon, Ind., and John Semen, Baton Rouge, La., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 16, 1982, Ser. No. 358,834

Int. Cl.[3] **C08F** *8/00;* **C08L** *67/02*

U.S. Cl. 525—175 **12 Claims**

1. A process for increasing the rate of crystallization of (a) a polyester compound selected from the group consisting of a poly(butylene terephthalate) and a blend of poly(butylene terephthalate) and poly(ethylene terephthalate) which comprises incorporating therein (b) an alkali metal salt of benzoic acid in an amount sufficient to promote the rate of crystallization of (a).

2. A process for increasing the rate of crystallization of a polyester compound selected from the group consisting of a poly(butylene terephthalate) and a blend of poly(butylene terephthalate) and poly(ethylene terephthalate) which comprises incorporating therein (b) an ionomer in an amount sufficient to promote the rate of crystallization of (a).

4,401,793

POLYMERIC ADDUCTS WITH PENDANT POLYMERIZABLE DOUBLE BONDS, THEIR PREPARATION AND USE AS REACTIVE THICKENERS IN IMPROVED ANAEROBIC COMPOSITIONS

Wen B. Chiao, Piscataway, and Dilip K. Ray-Chaudhuri, Bridgewater, both of N.J., assignors to National Starch And Chemical Corporation, Bridgewater, N.J.

Filed Sep. 4, 1981, Ser. No. 299,390

Int. Cl.[3] **C08F** *267/04*

U.S. Cl. 525—285 **13 Claims**

1. An anaerobic composition, comprising:

(A) about 5–95% by weight of a polymerizable, anaerobically curable C_2–C_5 hydroxyalkyl acrylate or methacrylate monomer;

(B) about 5–95% by weight of a polymerizable polymeric adduct having pendant double bonds as a reactive thickener; the adduct being the additive reaction product of the C_2–C_5 hydroxyalkyl acrylate or methacrylate monomer of (A) and an anhydride-containing polymer derived from about 0.5–50 mole % maleic, citraconic, or itaconic anhydride and about 50–99.5 mole % of a monomer having the formula $CH_2{=}C(R^1)X$, wherein R^1 is H, CH_3 or CN, X is a phenyl or COOR group, and R is a halogen substituted or unsubstituted C_1–C_{10} alkyl group or a halogen, alkoxy, or ester substituted or unsubstituted C_7–C_{20} aralkyl group, the adduct being free of unreacted anhydride groups;

(C) 0–15% by weight of a carboxyl-containing monomer; and

(D) a free radical inhibitor in sufficient concentration to initiate cure upon the exclusion of oxygen.

4,401,794

MOISTURE CURING OF POLYMER COATING COMPOSITIONS CONTAINING ISOCYANATOALKYL ESTERS OF UNSATURATED CARBOXYLIC ACIDS

Sharon L. Oriel, and Jimmy D. Flowers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 181,501, Aug. 26, 1980, abandoned. This application Oct. 16, 1981, Ser. No. 312,044

Int. Cl.[3] **C08F** *6/26*

U.S. Cl. 525—328.2 **12 Claims**

1. A method of curing a polymer containing an isocyanatoalkyl ester of an unsaturated carboxylic acid, comprising contacting the polymer with a sufficient amount of water to substantially cross-link the isocyanate groups.

4,401,795

POLYMERIC POLYELECTROLYTES

Daniel F. Herman, Princeton, and Uno Kruse, Neptune, both of N.J., assignors to NL Industries Inc., New York, N.Y.

Division of Ser. No. 56,564, Jul. 11, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,441

Int. Cl.[3] **C08F** *20/04*

U.S. Cl. 525—327.8 **10 Claims**

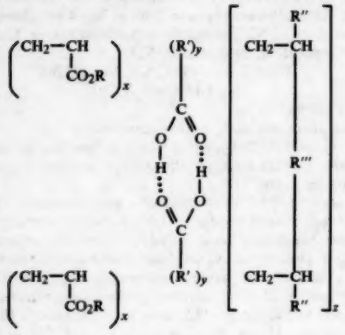
1. In an absorbent dressing comprising an absorbent layer

containing a water-swellable, water-insoluble material, the improvement which comprises having at least a portion of the water-swellable, water-insoluble material being an alkaline salt of a polymer prepared by the reaction of

(a) from about 15% to about 50% by weight of an olefinically-unsaturated carboxylic acid containing an activated carbon-to-carbon olefinic double bond and at least one carboxyl group;

(b) from about 49.07% to about 82% by weight of an alkyl acrylate wherein the alkyl group has from 1 to 6 carbon atoms; and

(c) from about 0.03% to about 3.0% by weight of a crosslinking agent which are polyunsaturated polymerizable vinyl monomers containing two or more free radical polymerizable ethylenic groups, said crosslinking agent being introduced directly into the carbon-carbon backbone of the polymer; and having the formula:



wherein:

x represents the relative number of alkyl acrylate groups with R being 1 to 6 carbon atoms as component (b);

y represents the relative number of olefinically-unsaturated carboxylic acid groups with R′ being the hydrocarbon portion of the carboxylic acid compounds of component (a);

z represents the relative number of crosslinking agents of component (c) with R″ being hydrogen or methyl and R‴ comprising the remaining portion of component (c).

4,401,796

SOLID-PHASE SYNTHESIS OF POLYNUCLEOTIDES

Kelichi Itakura, Arcadia, Calif., assignor to City of Hope Research Institute, Duarte, Calif.

Filed Apr. 30, 1981, Ser. No. 258,924

Int. Cl.³ C08F 8/40

U.S. Cl. 525—340 **51 Claims**

1. A method of forming a polynucleotide, including the following steps:

providing a resin support,

phosphorylating a nucleoside to provide a monotriazolide,

combining the monotriazolide with the resin support to provide a dimethoxytrityl resin, and

substituting a hydroxyl group for the dimethoxytrityl group in the dimethoxytrityl resin to provide the polynucleotide.

4,401,797

COPOLYMERS AND HYDROGELS: PROCESS AND ARTICLES MADE THEREOF

Paul M. Gallop, Chestnut Hill, Mass., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

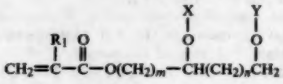
Filed May 20, 1981, Ser. No. 265,304

Int. Cl.³ C08F 220/12, 220/20

U.S. Cl. 525—383 **14 Claims**

1. A polymer formed by a free radical bulk polymerization of:

(a) a first monomer of the formula:



wherein:

R_1 is hydrogen or methyl;

m is an integer from 1 to 4; and

n is an integer from 0 to 1;

X and Y are protecting groups and are independently selected from the group consisting of:

(1) —C(O)OR$_2$

wherein R_2 is an alkyl group containing from 1 to 8 carbon atoms;

(2) hexahydropyranyl; and

(3) where X and Y together form one protecting group selected from the group consisting of:

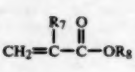
(i) >B—R$_3$

wherein:

R_3 is a lower alkyl group containing 1 to 6 carbon atoms, cycloalkyl group containing 3 to 6 carbon atoms; and aryl selected from the group consisting of phenyl, tolyl and naphthyl; and

(ii) >S=O

(b) a second substantially water insoluble monomer of the formula:



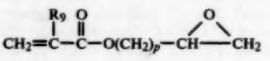
wherein:

R_7 is hydrogen or methyl; and

R_8 is lower alkyl having 1 to 6 carbon atoms or cycloalkyl having from 3 to 6 carbon atoms;

the molar ratio of said first monomer to said second monomer being between about 1:30 and 20:1; and

(c) optionally, a third substantially water insoluble monomer of the formula:

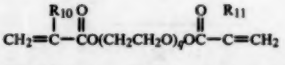


(i)

wherein:

R_9 is hydrogen or methyl; and

p is an integer from 1 to 6; or



(ii)

wherein:

R_{10} and R_{11} are independently hydrogen or methyl, and

q is an integer from 1 to 6;

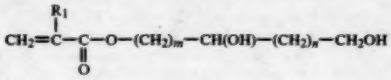
the concentration of said third monomer when present being between about 0 and 30 percent by weight of the first monomer;

said protection group(s) being subsequently removable by chemical means after said bulk polymerization;

wherein said polymer can be handled, machined, and shaped over a wide humidity range as compared to a hydrogel polymer and can be polished and machined using water based and water-compatible oils, abrasives and polishes.

10. A process for preparing a polymer which comprises:

(a) treating a monomer of the formula:



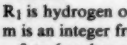
wherein:

R_1 is hydrogen or methyl; and

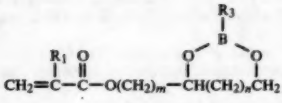
m is an integer from 0 to 6 or cycloalkyl containing from 3 to 6 carbon atoms;

n is an integer from 0 to 1;

with a boronic acid of the formula:



wherein: R_3 is lower alkyl containing 1 to 6 carbon atoms or aryl selected from the group consisting of phenyl tolyl and naphthyl to form an adduct of the formula:

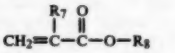


wherein B, R_1, R_2, m and n are defined above and

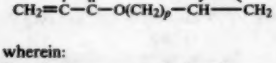
corresponds to a boron-containing protecting group;

(b) purifying said adduct using non-aqueous, non-hydroxylic organic solvents;

(c) mixing said purified adduct with a second monomer of the formula:



(d) optionally mixing said purified adduct and second monomer with a third monomer of the formula:

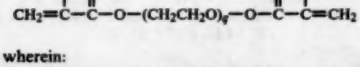


(i)

wherein:

R_9 is hydrogen or methyl; and

r is an integer from 1 to 6; or a third monomer of the formula:



wherein:

R_{10} and R_{11} are independently hydrogen or methyl; and

q is an integer from 1 to 6;

(e) polymerizing by a free radical bulk polymerization process said mixture of said purified adduct and said monomer(s).

11. The process of claim **10** further including removing the boron-containing protecting groups and the regeneration of the hydroxyl groups.

4,401,798

PROCESS FOR THE PRODUCTION OF VINYL HALIDE POLYMERS THAT USES AN ALKYL-SUBSTITUTED TRISPHENOL AS THE CHAIN-TERMINATING AGENT

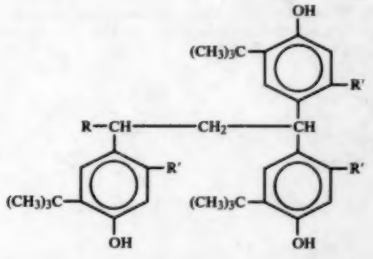
Mario Q. Ceprini, Cedarhurst, N.Y.; Donald Goodman, Flemington, N.J., and Samuel Hoch, Brooklyn, N.Y., assignors to Tenneco Polymers, Inc., Houston, Tex.

Filed Apr. 22, 1982, Ser. No. 370,876

Int. Cl.³ C08F *6/02, 14/06*

U.S. Cl. 526—84 **6 Claims**

1. In the process for the polymerization of a monomer component selected from the group consisting of vinyl halides and mixtures of a vinyl halide with at least one ethylenically-unsaturated monomer that is copolymerizable therewith, said mixtures containing at least 70% by weight of the vinyl halide, in an aqueous medium at a temperature in the range of 40° C. to 80° C. in the presence of a free radical generating polymerization initiator, the improvement that comprises adding to the polymerization reaction mixture when from about 70% to 95% of the monomer component has been polymerized from 0.01% to 0.10% by weight, based on the weight of the monomer component, of a chain-terminating agent having the structural formula



wherein R represents hydrogen or an alkyl group having 1 to 4 carbon atoms and each R′ represents an alkyl group having 1 to 4 carbon atoms.

4,401,799

TITANIUM TRICHLORIDE CATALYST AND PROCESS FOR THE PRODUCTION THEREOF

Hiroshi Ueno, Namekawa; Eiji Sezaki; Naomi Inaba, both of Ooi, Japan; Tokuo Makishima, Kawagoe; Koh Watanabe, Kunitachi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 10,763, Feb. 9, 1979, Pat. No. 4,183,826, which is a continuation-in-part of Ser. No. 774,947, Mar. 7, 1977, abandoned. This application Jul. 20, 1979, Ser. No. 59,414

Claims priority, application Japan, Jun. 25, 1976, 51-74456

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ C08F *4/64, 10/04*

U.S. Cl. 526—142 **4 Claims**

1. In a process for the stereoregular polymerization of α-olefins, wherein an α-olefin is contacted with a titanium trichloride containing catalyst component and an organo metallic compound co-catalyst component under α-olefin polymerization conditions, the improvement comprising:

employing as said titanium trichloride containing component, a titanium trichloride catalyst complex produced by a process comprising;

reducing titanium tetrachloride with an organo metal compound of the formula R_nAlX_{3-n} wherein R is an alkyl or aryl group having 1 to 18 carbon atoms, X is a halogen

atom, and n is a numeral within the range of 1 to 3, at a temperature of from about −50° to about +30° C. to produce a reduced solids product;

suspending said reduced solids product at a temperature in the range of about 60° C. to about 100° C. for about 1 to about 10 hours in a chlorinated saturated aliphatic hydrocarbon having 3 to 8 carbon atoms and 2 to 6 chlorine atoms in the presence of a complexing agent selected from an aliphatic ether compound having 4 to 16 carbon atoms; and

recovering the resulting treated reduced solids product as a highly active titanium trichloride catalyst component.

4,401,800
LITHIUM ALKOXIDE DIAMINES AS MODIFIERS FOR POLYMERIZATION OF DIENES USING LITHIUM-BASED INITIATORS

James E. Hall, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 14, 1982, Ser. No. 388,347
Int. Cl.³ C08F 4/48, 36/06
U.S. Cl. 526—175 **14 Claims**

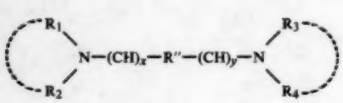
1. A catalyst system comprising:

(a) at least one anionic initiator based on lithium, and

(b) at least one lithium alkoxide diamine chelate formed by mixing

(i) at least one lithium compound of the formula $R(Li)_{x''}$ wherein R represents a hydrocarbyl radical of 1 to 20 carbon atoms and x'' is an integer of 1 to 4, and

(ii) at least one hydroxy or ketone group containing diamine selected from the group consisting of the following structural formulas:



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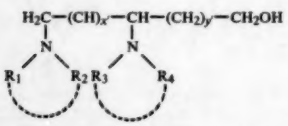


(II)

wherein x and y are the same or different and are 1 or 2; x' and y' independently are 0, 1 or 2; R'' represents —CH(OH)— or —C(O)—; and R_1, R_2, R_3 and R_4 are the same or different and are alkyl radicals of 1 to 3 carbon atoms inclusive, or R_1 and R_2, and R_3 and R_4 are joined together to form a five member heterocyclic ring structure.

4,401,801
COATING AND DRESSING AGENTS FOR LEATHER AND LEATHER SUBSTITUTES BASED ON POLYURETHANE UREA COATING COMPOUNDS

Josef Pedain, Cologne; Wilhelm Thoma, Leverkusen; Jürgen Grammel, Cologne, and Walter Schröer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,371
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134112
Int. Cl.³ C08G 18/65
U.S. Cl. 528—67 **14 Claims**

1. A composition for coating and dressing leather and leather substitutes which is based on linear or slightly branched thermoplastic polyurethane ureas comprising the reaction product of

(A) two macrodiol components wherein

(1) the first component comprises one or more macrodiols having an average molecular weight of from about 254 to 650 and containing at least one benzene, cyclohexane or cyclohexene ring and

(2) the second component comprises one or more macrodiols having an average molecular weight of from about 1200 to 3000 and wherein the average molecular weight ratio of component (A/2) to component (A/1) is at least about 3:1 and the molar ratio of component (A/2) to component (A/1) is about 1:6 to 6:1;

(B) from about 0.5 to 11 mol of chain lengthening agent per mole of component (A) wherein at least about 50 mol % of said chain lengthening agent is selected from the group consisting of aliphatic diamines, cycloaliphatic diamines, hydrazine and mixtures thereof; and

(C) cycloaliphatic diisocyanates wherein up to about 50 mol % of said cycloaliphatic diisocyanates may be replaced by aliphatic and/or aromatic diisocyanates.

4,401,802
PROCESS FOR THE PREPARATION OF THERMOPLASTIC AROMATIC POLYPHOSPHONATOCARBONATES WITH IMPROVED HEAT-AGEING RESISTANCE, AND THEIR USE

Manfred Schmidt, Pittsburgh, Pa.; Ludwig Bottenbruch, and Dieter Freitag, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 12, 1981, Ser. No. 224,077
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001863
Int. Cl.³ C08G 63/62
U.S. Cl. 528—167 **7 Claims**

1. A process for preparing an aromatic, thermoplastic polyphosphonatocarbonate of improved heat-ageing resistance which comprises polycondensing (A) at least one aromatic dihydroxy compound having 6 to 30 carbon atoms with (B) a diaryl carbonate having 6 to 14 carbon atoms in each aryl moiety and (C) a phosphonic acid diaryl ester having 6 to 14 carbon atoms in each aryl moiety in the presence of 10^{-7} to 2.10^{-2} mole percent, per mole of aromatic dihydroxy compound, of at least one catalyst selected from the group consisting of (a) tetra-C_1–C_{18}-alkyl titanates, (b) di-C_2–C_4-alkyl-tin oxides, (c) di-C_2–C_4-alkyl-di-C_1–C_4-alkoxy-tin compounds, (d) tetra-C_3–C_{18}-alkyl zirconates, (e) tri-C_2–C_{18}-alkyl vanadylates and (f) mixtures of germanium dioxide or titanium dioxide with at least one of the catalysts listed under (a) to (e), in a weight ratio of 1:3 to 3:1 at a temperature of from 80°–340° C. and under a pressure of from 600 to 0.1 mm Hg in an inert gaseous atmosphere, the molar ratio of (B) to (C) being from 5:95 to 95:5 and the molar ratio of (A) to the sum of (B) and (C) being from 0.91:1 to 0.99:1.

4,401,803
PROCESS FOR THE PREPARATION OF AROMATIC POLYESTERS

Werner Rieder, Vienna, Austria, assignor to Isovolta Osterreiche Isolierstoffwerk Aktiengesellschaft, Wiener Neudorf, Austria

PCT No. PCT/AT81/00016, § 371 Date Jan. 18, 1982, § 102(e) Date Jan. 18, 1982, PCT Pub. No. WO82/00149, PCT Pub. Date Jan. 21, 1982
PCT Filed Jun. 26, 1981, Ser. No. 342,007
Claims priority, application Austria, Jun. 20, 1980, 3344/80
Int. Cl.³ C08G 63/18, 63/24
U.S. Cl. 528—176 **9 Claims**

1. In a process for the preparation of aromatic polyesters of diphenols and aromatic dicarboxylic acid chlorides in a two-phase interfacial polycondensation using an aqueous phase of a solution of an alkali metal diphenolate and a phase transfer catalyst in water and optionally an organic solubilizer and an organic phase of a solution of the aromatic dicarboxylic acid

chloride in a chlorinated organic solvent with the resulting polyester remaining dissolved in the organic phase, the improvement comprising circulating the reaction mixture in the form of a dispersion of the aqueous phase and the organic phase through a dispersing means and continuously introducing a solution of the aromatic dicarboxylic acid chloride in a substantially anhydrous chlorinated organic solvent into the circulation flow at a point up stream of the dispersing means.

4,401,804

DEACTIVATION OF POLYESTER CATALYST RESIDUES

Willis C. Wooten, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1982, Ser. No. 381,128
Int. Cl.³ C08G 63/70
U.S. Cl. 528—272 8 Claims

1. A process for deactivating polymerization catalyst residues which form color bodies with phenolic stabilizers which comprises contacting polymeric compositions containing said polymerization catalyst residues with at least one member selected from the group consisting of mono- or dihydrogen phosphonate and mono-, di-, or trihydrogen phosphate compounds and at least one member selected from the group consisting of di- and triester phosphonate compounds or a phosphite compound.

4,401,805

MODIFIED POLY(ETHYLENE TEREPHTHALATE) HAVING IMPROVED GAS BARRIER PROPERTIES

Doyle A. Weemes, Greeneville; Robert W. Seymour, and Thomas H. Wicker, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,715
Int. Cl.³ C08G 63/16
U.S. Cl. 528—302 6 Claims

1. A container having improved resistance to oxygen and carbon dioxide permeability comprising a copolyester derived from an acid component consisting essentially of 55–99 mol % terephthalic acid, 45–1 mol % of at least one acid of the formula $HOOC—(CH_2)_n—COOH$ where n is 1 to 6, and a glycol component, at least 60 mol % of which is ethylene glycol, said copolyester having an I.V. of about 0.1–1.5.

4,401,806

PROCESS FOR PRODUCING GRAFT COPOLYMER

Hiroshi Hagiwara, and Takao Iwasaki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1982, Ser. No. 341,701
Claims priority, application Japan, Jan. 27, 1981, 56-10608; May 15, 1981, 56-73090
Int. Cl.³ C08J 3/16
U.S. Cl. 528—498 12 Claims

1. A process for producing a graft copolymer, which comprises mixing a graft copolymer latex obtained by graft-polymerizing hard-polymer-giving monomers onto an elastic trunk polymer with an organic liquid, either after the coagulation of the latex or in the presence of a coagulant, said organic liquid being substantially insoluble in water and does not dissolve but can wet the graft copolymer, said mixture being effected in the presence of water to form dispersion wherein water forms a continuous dispersion medium phase and wherein the volume ratio of the organic liquid to the graft copolymer is 0.9 to 7.5 and the total volume of the graft copolymer and the organic liquid is less than 40% of the volume of the dispersion, whereby the coagulated graft copolymer is impregnated with the organic liquid and dispersed in water, and subsequently recovering the dispersed copolymer particles from the dispersion.

4,401,807

SHAPED MATERIAL COMPRISING ACYLATED PRODUCT OF MIXTURE OF CHITIN DERIVATIVES

Junichi Koshugi, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sep. 10, 1980, Ser. No. 185,953
Claims priority, application Japan, Sep. 18, 1979, 54-119846
Int. Cl.³ C08B 37/08
U.S. Cl. 536—20 10 Claims

1. A shaped material having at least a surface layer which consists essentially of an acylated mixture of at least two kinds of chitin derivatives selected from the group consisting of de-acetylated chitin and the compounds represented by the general formula (1):

$$[C_6H_8O_3(NH_2)_x(NHCOCH_3)_y(OR_a(OH)_b]_n \quad (1)$$

wherein R represents a carboxyalkyl group with two to four carbon atoms, a hydroxyethyl group, a hydroxypropyl group, a dihydroxypropyl group or an alkyl group with one to three carbon atoms; x is a number of 0.1 to 1.0; y is a difference between 1.0 and x; a is number of 0.1 to 1.0 and b is a difference between 1.0 and a, or salts thereof.

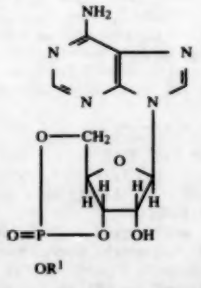
4,401,808

ADENOSINE CYCLIC 3',5'-PHOSPHATE TRIESTERS AND THE ACID ADDITION SALTS THEREOF, AND PROCESS FOR PRODUCTION THEREOF

Nobuyuki Yamaji, and Motohiko Kato, both of Noda, Japan, assignors to Kikkoman Corporation, Chiba, Japan

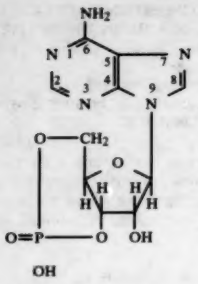
Continuation-in-part of Ser. No. 177,490, Aug. 12, 1979, abandoned. This application Nov. 2, 1981, Ser. No. 317,282
Claims priority, application Japan, Aug. 13, 1979, 54-102282
Int. Cl.³ C07H 19/20, 19/00
U.S. Cl. 536—27 3 Claims

1. A process for producing triesters of adenosine cyclic 3',5'-phosphoric acid of the following formula



(I)'

wherein R^1 represents a linear or branched alkyl group having 1 to 20 carbon atoms, or the acid addition salts thereof, which comprises reacting an adenosine cyclic 3',5'-phosphoric acid of the following formula



(II)

or its salt with an alkyl halide of the following formula

$$R^1—X \quad \text{(III)}$$

wherein R^1 is as defined above, and X represents a halogen atom,

in the presence of a base in the absence or presence of a solvent.

4,401,809

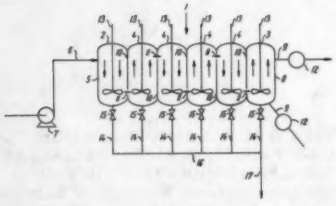
NITROCELLULOSE PURIFICATION

David F. Fair, 102 Mountainview Dr., Hackettstown, N.J. 07840

Filed Apr. 5, 1982, Ser. No. 365,124

Int. Cl.³ C08B *5/04*

U.S. Cl. 536—42 **5 Claims**



1. A continuous process of purifying nitrocellulose by stabilizing and poaching a slurry of nitrocellulose produced by the nitric acid-sulfuric acid nitration of cellulose comprising continually pumping the slurry through an inlet line into the first of a series of adjacent pressure vessels making up an autoclave, each of said vessels having a common wall with vessels adjacent to it and an agitator therein; heating said slurry in said vessels to about 100° C. to 200° C. while agitating under a pressure of about 1 to 17 atmospheres, causing the slurry to flow through passageways in said common walls arranged to provide serpentine flow through the series of said vessels under said pressure while agitating; and continually discharging the treated slurry through a discharge line in the last of the series of said vessels.

4,401,810

METHOD OF STABILIZING FELTED CELLULOSIC SHEET MATERIAL WITH AN ALKALI METAL BOROHYDRIDE

Lucia C. Tang, Potomac, Md., and Margaret A. Troyer, Washington, D.C., assignors to United States of America as represented by the Librarian of Congress, Washington, D.C.

Filed Sep. 8, 1981, Ser. No. 300,326

Int. Cl.³ D21C *3/00*

U.S. Cl. 536—56 **6 Claims**

1. A method of stabilizing and brightening felted cellulosic sheet material by contacting said sheet material with a solution containing between 0.1 to 10 percent of an alkali metal borohydride, washing said sheet material in a wash of the solvent of said solution wherein the wash contains between 5 and 1500 ppm of a compound selected from the group consisting of an alkaline earth metal hydroxide, alkaline earth metal carbonate, and alkaline earth metal bicarbonate and subsequently drying said sheet material.

4,401,811

PROCESS FOR THE PRODUCTION OF A CATION EXCHANGER: TREE BARK TREATED WITH ALKALI AND SULFURIC ACID FOR WASTE WATER TREATMENT

Sven E. Jorgensen, Langkaer Vaenge 9, DK-3500 Vaerlose, Denmark

Filed Dec. 14, 1981, Ser. No. 330,441

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048356

Int. Cl.³ B01J *39/22*; C02F *1/42*

U.S. Cl. 536—59 **17 Claims**

1. A process for the production of a cation exchanger useful for the treatment of waste water, said process comprising the steps of:

providing a batch of comminuted bark,

separately treating said batch of comminuted bark with an alkali hydroxide solution of at least 5% by weight alkali hydroxide and sulfuric acid of between 30 and 75% by weight, and

washing said comminuted bark with water after each said separate treating step.

4,401,812

ANTHRACYCLINE ANTIBIOTICS

Akiko Fujiwara; Tatsuo Hoshino, both of Kamakura, and Masaaki Tazoe, Yokohama, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

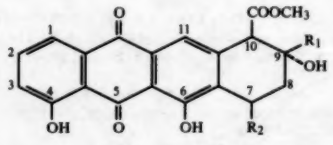
Filed Oct. 2, 1981, Ser. No. 307,832

Claims priority, application United Kingdom, Oct. 16, 1980, 8033399

Int. Cl.³ C07H *15/26*; C12P *19/56*; A61K *31/71*

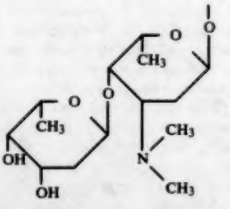
U.S. Cl. 536—6.4 **1 Claim**

1. A compound of the formula,



I

wherein R_1 is an acetonyl group and R_2 is selected from the group consisting of



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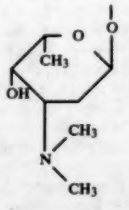

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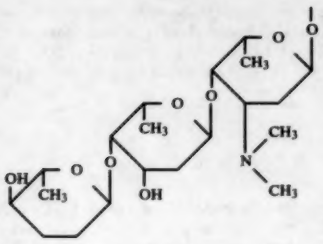

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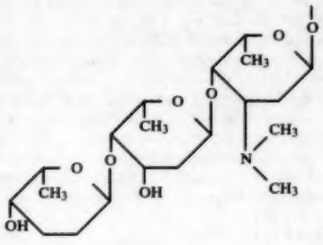

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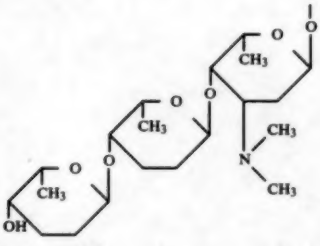
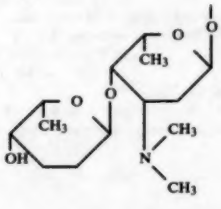


G and



H

4,401,813

PROCESS FOR PREPARING ALKALI METAL SALT OF CARBOXYMETHYL CELLULOSE

Jack L. Lowell; Michael J. Nevins; Kenneth I. G. Reid, all of Houston, and Kenneth L. Walter, The Woodlands, all of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Dec. 10, 1981, Ser. No. 331,299

Int. Cl.³ C08G *59/00*

U.S. Cl. 536—98 **9 Claims**

1. In a process for preparing an alkali metal salt of carboxymethyl cellulose comprising forming an alkali cellulose in a solution of isopropanol and water and thereafter adding monochloroacetic acid to form the carboxymethyl cellulose ether, the improvement which comprises conducting the causticization of high molecular weight cellulose in the absence of air at a temperature less than about 35° C. in an aqueous solution containing from 84.9% to 88.9% by weight isopropanol, and at an isopropanol-water solution: cellulose weight ratio from about 2:1 to about 7.5:1, wherein the amount of alkali metal hydroxide utilized to form the alkali cellulose is such that the alkali metal hydroxide to monochloroacetic acid molar ratio during the subsequent carboxymethylation of the cellulose is greater than 2.00 to 1, and wherein the monochloroacetic acid contains less than 2% by weight of dichloroacetic acid, whereby there is produced an alkali metal salt of carboxymethyl cellulose.

4,401,814

ADENINE PREPARATION

Kju H. Shin, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 16, 1981, Ser. No. 331,034

Int. Cl.³ C07D *437/74*

U.S. Cl. 544—277 **7 Claims**

1. A process for the preparation of adenine which comprises reacting a dinitrile of diaminomaleic acid with N-dichloromethylformamidinium chloride and ammonia at elevated temperature in the presence of formamide and an ammonium salt of a lower alkanoic acid.

4,401,815

ISOINDOLINE COLORANTS

Wolfgang Lotsch, Beindersheim; Reinhard Kemper, Heidelberg; Gustav Bock, Neustadt, and Wolfgang Elser, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

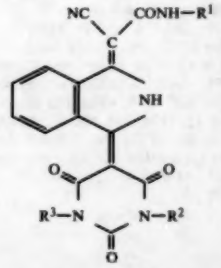
Filed Feb. 3, 1981, Ser. No. 231,047

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007301

Int. Cl.³ C09B *57/04*

U.S. Cl. 544—300 **8 Claims**

1. An isoindoline colorant of the formula



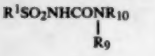
where R^1 is phenyl which is mono- or disubstituted by chlorine, or bromine, R^3 is hydrogen, and R^2 is C_1–C_4-alkyl; or R^1 is phenyl, naphthyl or a phenyl or napthyl group which is substituted by chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy or phenoxy, R^3 is hydrogen, and R^2 is phenyl, naphthyl or a phenyl or napthyl group which is substituted by chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy or phenoxy, wherein the number of substituents in R^1 and R^2 is 1, 2 or 3 with the proviso that if there are 2 or 3 substitutents, said substituents may be identical or different.

4,401,816
SULFAMOYL CHLORIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 144,857, Apr. 29, 1980, abandoned. This application Mar. 25, 1981, Ser. No. 244,173
Int. Cl.[3] C07D *239/42*; A01N *9/22*
U.S. Cl. 544—320 13 Claims

1. A compound selected from



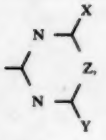
(I)

wherein

R_9 is H, CH_3 or OCH_3;

R^1 is Cl, $(CH_3)_2N$ or

R_{10} is



X is CH_3 or OCH_3;

Y is H, CH_3, OCH_3, OCH_2CH_3, OCH_2CF_3, Cl, CH_2OCH_3, $CH_2OCH_2CH_3$ or CF_3; and

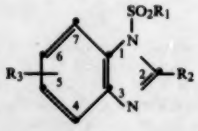
Z is CH, CCH_3 CCH_2CH_3, CCH_2CH_2Cl, CCl, CBr or CCF_3.

4,401,817
CARBONYL-SUBSTITUTED 1-SULFONYLBENZIMIDAZOLES

Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 255,574, Apr. 20, 1981, Pat. No. 4,338,329, which is a division of Ser. No. 94,149, Nov. 14, 1979, Pat. No. 4,289,782, which is a division of Ser. No. 30,782, Apr. 17, 1979, Pat. No. 4,230,868, which is a division of Ser. No. 883,113, Mar. 3, 1978, Pat. No. 4,174,454, which is a division of Ser. No. 750,991, Dec. 15, 1976, Pat. No. 4,118,742, which is a continuation-in-part of Ser. No. 608,415, Aug. 28, 1975, abandoned. This application Apr. 21, 1982, Ser. No. 370,631
Int. Cl.[3] C07D *419/14*; A61K *31/425*
U.S. Cl. 548—136 10 Claims

1. A compound of the formula



(I)

wherein

R_1 is thiazol-2-yl, 2-acetamido-4-methyl-thiazol-5-yl, 1,3,4-thiadiazol-2-yl, 2-methyl-1,3,4-thiadiazol-5-yl, or 2-methylamino-1,3,4-thiadiazol-5-yl;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

R_3 is hydroxy, C_2-C_8 alkanoyloxy, phenylacetoxy, α—C-1-CH_7 alkyl-α-hydroxybenzyl or benzoyloxy; or 1,3-dithiolan-2-yl, 1,3-dithian-2-yl, tetrazol-5-yl, 1-(C_1–C_4 alkyl)-tetrazol-5-yl, 1,3,4-oxadiazol-2yl, or 2-(C_1–C_4-alkyl)oxadiazol-5-yl; or

wherein R_6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, benzyl, phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl; or Z═C(R_6)—, wherein Z is hydroxyimino, C_1–C_4 alkoxyimino, C_1–C_4 acyloxyimino, benzyloxyimino, benzoyloxyimino, hydrazono, thiocarbamylhydrazono, carboxymethylimino, methoxycarbonylhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono, C_1–C_4 alkoxycarbonylethylcarbonyloxyimino, benzyloxycarbonylaminomethylcarbonyloxyimino, p-nitrobenzyloxycarbonylethylcarbonyloxyimino, phthalimidomethylcarbonyloxyimino, 2-(2-benzyloxycarbonyl-5-oxoisoxazolidin-4-yl)ethylcarbonyloxyimino or C_1–C_7 alkylidene; and

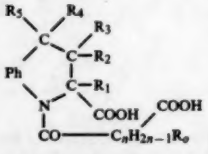
R_3 is at the 5 or 6 position.

4,401,818
1-CARBOXYALKANOYL-1,2,3,4-TETRAHYDROQUINOLINE-2-CARBOXYLIC ACIDS

Norbert Gruenfeld, White Plains, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,807
Int. Cl.[3] C07D *215/16*
U.S. Cl. 546—165 8 Claims

1. A 1-carboxy-(alkanoyl or aralkanoyl)-1,2,3,4-tetrahydroquinoline-2-carboxylic acid compound of the formula:



wherein Ph is unsubstituted 1,2-phenylene, or 1,2-phenylene substituted by one or two members selected from lower alkyl of 1 to 3 carbon atoms, lower alkoxy of 1 to 3 carbon atoms, hydroxy and halogeno, or 1,2-phenylene substituted by one lower alkylenedioxy of 1 to 2 carbon atoms or one trifluoromethyl group; R_o is hydrogen or HPh; each of R_1, R_2, R_3, R_4 and R_5 is hydrogen or lower alkyl of 1 to 3 carbon atoms; C_nH_{2n} represents straight chain or branched alkylene of 2 to 8 carbon atoms; the lower alkyl esters of 1 to 4 carbon atoms or pharmaceutically acceptable alkali metal, alkaline earth metal or ammonium salts of said acids.

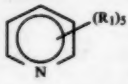
4,401,819

PROCESS FOR THE PREPARATION OF PYRIDINE AND SUBSTITUTED PYRIDINES

Georges Cordier, Francheville, and Patrick Leroux, Meudon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

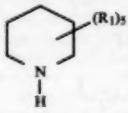
Filed Mar. 22, 1982, Ser. No. 360,567
Claims priority, application France, Apr. 1, 1981, 81 06692
Int. Cl.³ C07D 213/133, 213/09
U.S. Cl. 546—252 20 Claims

1. Process for preparation of compounds of the following general formula (I):



in which the radicals R_1, which are identical or different, represent a hydrogen atom or a linear or branched alkyl radical having 1 to 4 carbon atoms, by heating, in the vapor phase, at a temperature of 200° C. to 500° C.:

a compound of the following general formula (II):

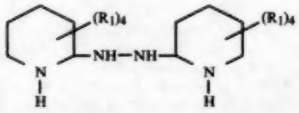


in which the radicals R_1 have the same meanings as above or

1,5-diaminopentane, or

1,5-diaminopentane containing, in its hydrocarbon part, from 1 to 3 linear or branched alkyl radicals having from 1 to 4 carbon atoms, or

a compound of the following general formula (III):



in which the radicals R_1 have the meanings indicated above, or

a mixture of several of the above compounds, the said process being characterized in that the reaction is carried out in the presence of a catalyst comprising palladium, platinum or ruthenium deposited on a macroporous solid support of which the average pore diameter is more than 200 Angstroms and of which the porous volume is between 0.5 and 1.4 cubic centimeters/gram.

4,401,820

PROCESS FOR RACEMIZING OPTICALLY ACTIVE α-AMINO ACIDS OR A SALT THEREOF

Ichiro Chibata, Suita; Shigeki Yamada, Toyonaka; Chikara Hongo, Osaka, and Ryuzo Yoshioka, Kaizuka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jan. 5, 1982, Ser. No. 337,322
Claims priority, application Japan, Jan. 23, 1981, 56-9380; Jun. 19, 1981, 56-95765
Int. Cl.³ C07D 233/64, 207/12, 209/20; C07B 20/00
U.S. Cl. 548—344 11 Claims

1. A process for producing a DL-α-amino acid or a salt thereof which comprises racemizing an optically active α-amino acid or a salt thereof at a temperature of 20° to 120° C. in the presence of 2 to 50 g of an aliphatic acid per g of said optically active acid or salt, said aliphatic acid having the formula

$$R^1—COOH \quad (I)$$

wherein R^1 is hydrogen or alkyl having 1 to 4 carbon atoms, and 0.001 to 0.5 mole of an aldehyde per mole of said optically active acid or salt, said aldehyde having the formula:

$$R^2—CHO \quad (II)$$

wherein R^2 is hydrogen; alkyl having 1 to 6 carbon atoms; alkenyl having 2 to 4 carbon atoms; phenyl; phenyl having at least one substituent selected from the class consisting of hydroxy, nitro, amino and alkoxy having 1 to 4 carbon atoms; phenylvinyl; oxygen-containing heteromonocyclic group; and hydroxynaphthyl.

2. The process according to claim 1, wherein the optically active α-amino acid is selected from the group consisting of alanine, valine, leucine, isoleucine, serine, threonine, cystine, cysteine, methionine, tryptophan, phenylalanine, tyrosine, 3-(3,4-dihydroxyphenyl)alanine, phenylglycine, p-hydroxyphenylglycine, arginine, lysine, ornithine, histidine, aspartic acid, glutamic acid, proline and hydroxyproline.

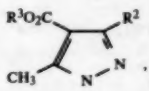
4,401,821

3-ARYL-5-METHYLPYRAZOLE-4-CARBOXYLIC ACID ESTERS

Peter Plath, Ludwigshafen; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 150,751, May 19, 1980. This application Jul. 2, 1981, Ser. No. 279,696
Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920933
Int. Cl.³ C07D 231/14, 405/04, 401/04, 409/04, 413/04
U.S. Cl. 548—374 3 Claims

1. A pyrazole derivative of the formula



where R^1 denotes formyl, acetyl, propionyl, chloroacetyl, dichloroacetyl, methoxyacetyl, methoxycarbonyl, or phenoxycarbonyl which is unsubstituted or mono- or polysubstituted by halogen, R^2 denotes phenyl which is mono- or polysubstituted by fluorine, chlorine, bromine, methyl, methoxy, cyano, nitro, trifluoromethyl, trifluoromethoxy or methoxycarbonyl, R^2 further denotes an unsubstituted or methyl- or chloro-substituted thienyl, furyl, oxazolyl or pyridyl, or R^2 denotes α-naphthyl or β-naphthyl, and R^3 denotes methyl, ethyl or isopropyl, or a salt thereof.

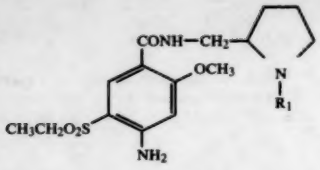
4,401,822

DERIVATIVES OF 4-AMINO-5-ALKYL SULPHONYL ORTHOANISAMIDES

Michel Thominet, Paris; Jacques Acher, Itteville, and Jean-Claude Monier, Lardy, all of France, assignors to Societe de'Etudes Scientifiques et Industrielles de l'Ile-de France, Paris, France

Continuation of Ser. No. 4,397, Jan. 18, 1979, Pat. No. 4,294,828. This application Oct. 9, 1981, Ser. No. 310,336
Claims priority, application France, Jan. 20, 1978, 78 01632
Int. Cl.³ C07D 207/08
U.S. Cl. 548—567 7 Claims

1. A compound of the formula



wherein R_1 is methyl, ethyl or allyl and the acid addition salts thereof with pharmacologically acceptable acids, the quaternary ammonium salts thereof and the levorotatory and dextrorotatory optical isomers thereof.

4,401,823

HYDROGENOLYSIS OF POLYHYDROXYLATED COMPOUNDS

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 18, 1981, Ser. No. 260,865
Int. Cl.[3] C07D *309/04*; C07C *51/377*
U.S. Cl. 549—356 **12 Claims**

1. A process for the hydrogenolysis of a polyhydroxylated compound selected from the group consisting of monosaccharides, disaccharides, mono-basic acids of saccharides, dibasic acids of saccharides, amino-monosaccharides, and alditols which comprises treating said compound at hydrogenolysis conditions in the presence of a catalyst comprising a shaped carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms impregnated with a metal selected from the group consisting of chromium, molybdenum, tungsten, rhenium, manganese, copper, cadmium and a Group VIII metal, and recovering the resultant mono-alcohol, hydrocarbon, ether, ketone and carboxylic acid products, wherein said reaction products are of a different class of compounds than the compounds that undergo hydrogenolysis.

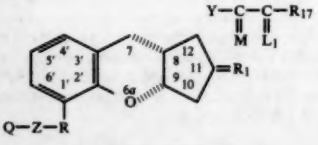
4,401,824

BENZOPYRAN COMPOUNDS, DERIVATIVES OF PROSTAGLANDINS

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 8, 1982, Ser. No. 355,814
Int. Cl.[3] C07D *311/78*
U.S. Cl. 549—385 **14 Claims**

1. A compound of the formula



wherein R is $—CH_2—$ or —O—; wherein Z is $—CH_2—$; $—CH_2CH_2—$; $—CF_2—$; $—CF_2CH_2$; or wherein —Z—R— taken together is trans—CH=CH—$CH_2—$ or trans—CH=CH—;

wherein Q is

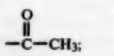
(1) $—COOR_5$, wherein R_5 is
- (a) hydrogen,
- (b) $(C_1–C_{12})$alkyl,
- (c) $(C_3–C_{10})$cycloalkyl,
- (d) $(C_7–C_{12})$aralkyl,
- (e) phenyl optionally substituted with one, 2 or 3 chloro or $(C_1–C_4)$alkyl,
- (f) phenyl substituted in the para-position with $—NHCOR_6$, $—COR_7$, $—OC(O)R_8$ or $—CH=N—NHCONH_2$, wherein R_6 is methyl, phenyl, acetamidophenyl, ,enzamidophenyl or $—NH_2$; R_7 is methyl, phenyl, -$—NH_2$, or methoxy; and R_8 is phenyl or acetamidophenyl;
- (g) phthalidyl,
- (h) 3-(5,5-dimethyl-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide,
- (i) 3-(5,5-di(hydroxymethyl)-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide, or
- (j) a pharmacologically acceptable cation;

(2) $—CH_2OH$;

(3) $—COL_2$, wherein L_2 is
- (a) an amino group of the formula $—NR_9R_{10}$ wherein R_9 is hydrogen or $(C_1–C_{12})$alkyl and R_{10} is
  - (i) hydrogen
  - (ii) $(C_1–C_{12})$alkyl
  - (iii) $(C_3–C_{10})$cycloalkyl,
  - (iv) $(C_7–C_{12})$aralkyl
  - (v) phenyl optionally substituted with one, 2 or 3 chloro, $(C_1–C_3)$alkyl, hydroxy, carboxy, $(C_2–C_5)$alkoxycarbonyl, or nitro,
  - (vi) $(C_2–C_5)$carboxyalkyl,
  - (vii) $(C_2–C_5)$carbamoylalkyl,
  - (viii) $(C_2–C_5)$cyanoalkyl,
  - (ix) $(C_3–C_6)$acetylalkyl,
  - (x) $(C_7–C_{12})$benzoylalkyl, optionally substituted by one, 2, or 3 chloro, $(C_1–C_3)$alkyl, hydroxy, $(C_1–C_3)$alkoxy, carboxy, $(C_2–C_5)$-alkoxycarbonyl, or nitro,
  - (xi) pyridyl, optionally substituted by one, 2, or 3 chloro, $(C_1–C_3)$alkyl, or $(C_1–C_3)$alkoxy,
  - (xii) $(C_6–C_9)$pyridylalkyl optionally substituted by one, 2, or 3 chloro, $(C_1–C_3)$alkyl, hydroxy, or $(C_1–C_3)$alkyl,
  - (xiii) $(C_1–C_4)$hydroxyalkyl,
  - (xiv) $(C_1–C_4)$dihydroxyalkyl,
  - (xv) $(C_1–C_4)$trihydroxyalkyl;
- (b) cycloamine selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrroline, or 3,4-didehydropiperidinyl optionally substituted by one or 2 $(C_1–C_{12})$alkyl;
- (c) carbonylamino of the formula $—NH_{11}COR_{10}$, wherein R_{11} is hydrogen or $(C_1–C_4)$alkyl and R_{10} is other than hydrogen, but otherwise defined as above;
- (d) sulfonylamino of the formula $—NR_{11}SO_2R_{10}$, wherein R_{11} and R_{10} are defined in (c);

(4) $—CH_2NL_3L_4$, wherein L_3 and L_4 are hydrogen or $(C_1–C_4)$alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when Q is $—CH_2NL_3L_4$;

(5) —CN;



(6)

wherein R_1 is oxo; H,H; α-OR_{12},β-H; α-H,β-OR_{12}; α-CH_2OR_{12},β-H; α-H,β-CH_2OR_{12} wherein R_{12} is hydrogen or a hydroxyl protective group;

wherein Y is trans —CH=CH—, cis—CH=CH—, $—CH_2CH_2—$, or —C≡C—;

wherein M is α-OR_{12},β-R_{14}; or α-R_{14},β-OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl;

wherein L_1 is α-R_{15},β-R_{16}; α-R_{16},β-R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro;

wherein R_{17} is

(1) $—C_mH_{2m}CH_3$ wherein m is an integer of from one to 5,

(2) phenoxy optionally substituted by one, 2, or 3 chloro, fluoro, trifluoromethyl, $(C_1–C_3)$alkyl, or $(C_1–C_3)$alkoxy, with the proviso that not more than two substituents are other than alkyl and with the proviso that R_{17} is phenoxy

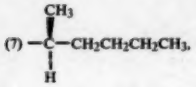
or substituted phenoxy, only when R_{15} and R_{16} are hydrogen or methyl, being the same or different;

(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, 2, or 3 chloro, fluoro, trifluoromethyl (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl,

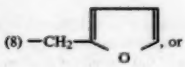
(4) cis—CH=CH—CH_2CH_3,

(5) —$(CH_2)_2$—CH(OH)—CH_3,

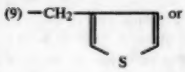
(6) —$(CH_2)_3$—CH=$C(CH_3)_2$,



(7) —$CH_2CH_2CH_2CH_3$,



(8) —CH_2—, or

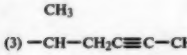


(9) —CH_2—, or

wherein —C(=L_1)—R_{17} taken together is

(1) (C_4–C_7)cycloalkyl optionally substituted by one to 3 (C_1–C_5)alkyl,

(2) 3-thienyloxymethyl,

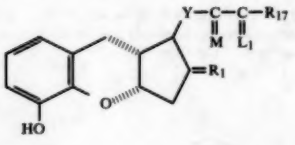


(3) —CH(CH_3)—$CH_2C{\equiv}C—CH_3$,

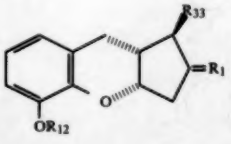
(4) —C≡C—$C_qH_{2q}CH_3$ wherein q is an integer of from 2 to 6, or

(5) —$C_pH_{2p}CH{=}CH_2$ wherein p is an integer of from 3 to 7; and individual optical isomers thereof.

14. A compound of the formula



or



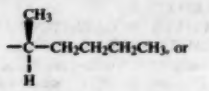
wherein R_1 is oxo; H,H; α-OR_{12},β-H; α-H,β-OR_{12}; α-CH_2OR_{12},β-H; α-H,β-CH_2OR_{12} wherein R_{12} is hydrogen or a hydroxyl protective group;

wherein Y is trans —CH=CH—, cis—CH=CH—, —CH_2CH_2—, or —C≡C—;

wherein M is α-OR_{12},β-R_{14}; or α-R_{14},β-OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl;

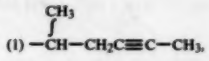
wherein L_1 is α-R_{15},β-R_{16}; α-R_{16},β-R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro;

wherein R_{17} is



—$CH_2CH_2CH_2CH_3$, or

wherein —C(=L_1)—R_{17} taken together is



(1) —CH(CH_3)—$CH_2C{\equiv}C—CH_3$,

(2) —C≡C—$C_qH_{2q}CH_3$ wherein q is an integer of from 2 to 6, or

(3) —$C_pH_{2p}CH{=}CH_2$ wherein p is an integer of from 3 to 7; wherein R_{12} is hydrogen or a hydroxyl protecting group; wherein R_{33} is

or —CH_2OR_{12} wherein R_{12} has the meaning defined above; and individual optical isomers thereof.

4,401,825

REACTIVE IRIDOID DERIVATIVES; PROCESS FOR MANUFACTURE AND APPLICATION OF SAME

Klaus Weinges, Heidelberg; Herbert von der Eltz, Plankstadt, and Hermann Jaggy, Bad Schönborn, all of Fed. Rep. of Germany, assignors to Willmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

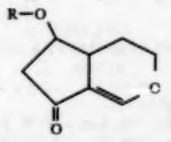
Filed Jul. 23, 1981, Ser. No. 285,989

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030477

Int. Cl.[3] **C07D** *309/12, 311/94*

U.S. Cl. 549—396 **4 Claims**

1. Iridoid derivatives of the general formula I,



(I)

wherein R is a hydrogen atom, an alkyl group with 1 to 5 carbon atoms, an alkanoyl group with 2 to 6 carbon atoms, a non-substituted aralkyl group with 7 to 12 carbon atoms, a methanesulfonyl group, or a toluenesulfonyl- group, a benzoyl group, a para-substituted nitrobenzoyl group chlorobenzoyl group or a tetrahydropyranyl-group.

4,401,826

METHOD FOR PRODUCTION OF MERCAPTO FUNCTIONAL SILANES

Terry G. Selin, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,577

Int. Cl.[3] **C07F** *7/08, 7/18*

U.S. Cl. 556—429 **11 Claims**

1. In a method for producing mercapto functional silane comprising reacting a haloalkyl silane and a thioureido compound in the presence of ammonia, the improvement compris-

ing carrying out said reaction in the presence of a tertiary nitrogen-containing compound.

4,401,827

NOVEL ACYL-DERIVATIVES OF CARNITINE AND PROCESS FOR THEIR PREPARATION

Paolo de Witt, Rome, Italy, assignor to Sigma-Tau, Rome, Italy

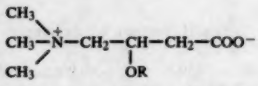
Continuation of Ser. No. 52,283, Jun. 26, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 334,604

Claims priority, application Italy, Jun. 27, 1978, 50065 A/78

Int. Cl.³ C07C 69/74

U.S. Cl. 560—1 **5 Claims**

1. Acyl derivatives of carnitine having the general formula:



(I)

wherein R is the monovalent radical of the following organic acids: 3-bromopropionic, 4-chorobutyric, cyclohexylcarboxylic, cyclohexylpropionic, α-methylenebutyric, β-methylenebutyric, cinnamic, p-methylcinnamic, p-chlorocinnamic, p-methoxycinnamic, m-trifluoromethylcinnamic, m-bromocinnamic, phenylacetic, p-isobutylphenylacetic, p-methylphenylacetic, p-ethylphenylacetic, p-cyclohexylphenylacetic, p-cyclopropylphenylacetic, p-isobutyl m-chlorophenylacetic, α-phenylpropionic, p-isobutyl, α-phenylpropionic, p-methyl, α-phenylpropionic, p-ethyl α-phenylpropionic, p-cyclohexyl α-phenylpropionic, p-cyclopropyl α-phenylpropionic, p-isobutyl α-phenylpropionic, 2-naphthalene acetic, malonic (monoester), glutaric (monoester), α-methylglutaric (monoester), adipic (monoester), pimelic (monoester), suberic (monoester), azelaic (monoester), sebacic (monoester), α-methyl-α-hydroxy glutaric (monoester), fumaric (monoester), citric (monoester), isocitric (monoester), pyruvic, levulinic, α-ketoglutaric (monoester), β-ketoglutaric (monoester), oxalacetic, γN-acetylaminobutric, εN-acetylaminocaproic, N-acetylaspartic (monoester), N-acetylglutamic (monoester), N-acetyl-5 aminoglutamic (monoester), N-acetylcysteine, S, N-diacetylcysteine, N-acetyl leucine, N-acetyl isolelucine, N-acetylmethionine, and N-acetylvaline.

4,401,828

PROCESS FOR PREPARING PHENOXYBENZOIC ACIDS

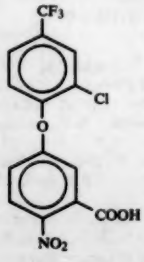
Charles M. Tanger, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 931,054, Aug. 4, 1978, Pat. No. 4,323,692. This application Sep. 10, 1979, Ser. No. 69,025

Int. Cl.³ C07C 79/46

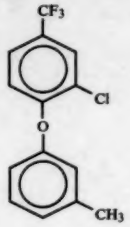
U.S. Cl. 560—21 **4 Claims**

1. A process for the preparation of a compound of the formula

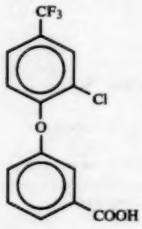


which comprises

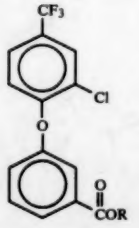
(a) oxidizing a phenoxy toluene of the formula



in an appropriate aprotic solvent selected from the group consisting of acetic acid, propionic acid and butyric acid in the presence of from about 0.01 to about 0.24 moles of a cobalt (II) salt per mole of phenoxy toluene, from about 1 to about 2 equivalents of bromide ion per mole of cobalt (II) salt, from about 0.5 to about 1 mole of a 30 to 35% aqueous solution of hydrogen peroxide per mole of cobalt (II) salt and a feed rate of from about 0.1 to about 0.003 moles of about a 10% to about a 100% molecular oxygen gas source per mole of phenoxy toluene, at temperatures from about 90° C. to about 110° C., at about atmospheric pressure to form a compound of the formula

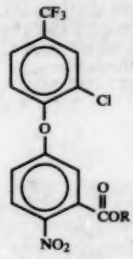


(b) esterifying the resulting carboxylic acid with an alcohol in the presence of an inert solvent and an acid catalyst to form a compound of the formula



wherein R is selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, t-butyl and

(c) nitrating the resultant ester at temperatures from about 0° to about 70° C. with a nitrating agent selected from the group consisting of nitric acid/sulfuric acid, potassium nitrate/sulfuric acid or nitric acid/sulfuric acid/acetic anhydride optionally in the presence of an inert solvent selected from the group consisting of methylene dichloride, ethylene dichloride, chloroform, and perchloroethylene to form a compound of the formula



wherein R is as defined above.

4,401,829
PROCESS FOR THE PREPARATION OF PERFLUORINATED CARBOXYLIC ACID FLUORIDES

Werner Schwertfeger, Butzbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

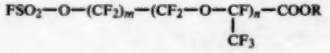
Filed Sep. 10, 1981, Ser. No. 300,920

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034549

Int. Cl.³ C07C *67/317*

U.S. Cl. 560—180 **10 Claims**

1. A process for the preparation of a perfluorinated carboxylic acid fluoride compound which comprises decomposition of a perfluorinated fluorosulfato compound of the formula



wherein R is alkyl, aryl or aralkyl having 1 to 10 carbon atoms, m is a number from 1 to 10, and n is a number from 0 to 10, said decomposition being conducted at a temperature of about −20° C. to 120° C. in the presence of a catalytically effective amount of from 1 to 50 mole %, relative to said fluorosulfato compound, of an alkali metal fluoride and in the absence of a solvent.

4,401,830
PROCESS FOR PREPARATION OF 3-ALKOXY-4-HYDROXYPHENYLACETIC ACID

Sumio Umumura; Fumio Iwata; Kikuo Ataka, and Hiroshi Shiraishi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jan. 2, 1981, Ser. No. 222,155

Claims priority, application Japan, Jan. 11, 1980, 55-1358

Int. Cl.³ C07C *65/01*

U.S. Cl. 562—478 **10 Claims**

1. A process for preparing a 3-alkoxy-4-hydroxyphenylacetic acid, which comprises reacting a 2-alkoxyphenol with glyoxylic acid in the presence of an alkali to form a reaction mixture containing 3-alkoxy-4-hydroxymandelic acid together with 3-alkoxy-2-hydroxymandelic acid, and 3-alkoxy-2-hydroxy-5(hydroxycarboxymethyl)-mandelic acid, and then subjecting said reaction mixture containing said 3-alkoxy-4-hydroxymandelic acid to catalytic redution with hydrogen using a palladium catalyst while controlling the pH value of said reaction mixture at not higher than 4 to form said 3-alkoxy-4-hydroxyphenylacetic acid without substantially reducing said 3-alkoxy-2-hydroxymandelic acid and said 3-alkoxy-2-hydroxy-5(hydroxycarboxymethyl-mandelic acid and then separating said 3-alkoxy-4-hydroxyphenylacetic acid from said reaction mixture.

4,401,831
SUBSTITUTED 3-ARYL-2-CYCLOALKEN-1-ONE AND METHOD OF PREPARATION THEREOF

Erich Cohnen, Hamburg, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

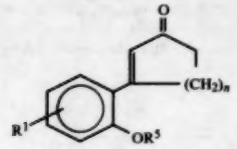
Division of Ser. No. 248,928, Mar. 30, 1981, Pat. No. 4,358,460. This application May 27, 1982, Ser. No. 382,614

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012012

Int. Cl.³ C07C *49/683, 103/42*

U.S. Cl. 564—221 **11 Claims**

1. A substitute alkenone of Formula II

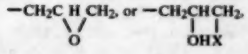


(II)

wherein

R^1 is alkyl or acylamino each having 1 to 4 carbon atoms, hydrogen, or halogen,

R^5 is hydrogen, benzyl,



where X is chlorine or bromine, and

n is 1 or 2.

4,401,832
PROCESS FOR PREPARING α-[(ALKYLAMINO)METHYL]-β-ARYLOXY-BENZENEETHANOLS

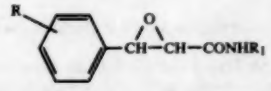
Dong H. Kim, Wayne, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 921,294, Jul. 3, 1978, Pat. No. 4,341,718. This application Aug. 10, 1981, Ser. No. 291,896

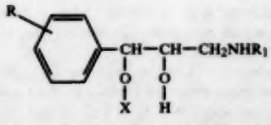
Int. Cl.³ C07C *83/00*

U.S. Cl. 564—347 **5 Claims**

1. A process which comprises reacting a 3-phenyl-2-oxiranecarboxamide of the formula:



wherein R is hydrogen, halogen, lower alkyl or lower alkoxy and R_1 is lower alkyl, with an alkali metal aryloxide in the presence of a crown ether to yield a 3-aryloxy-3-phenyl-1-alkylamino-2-propanol of the formula:



wherein R and R_1 are as defined above and X is phenyl, 1-naphthyl, or a phenyl group substituted by a halogen, a lower alkyl group, or a lower alkoxy group, in which the aryloxide anion has the formula XO, where X is as defined above.

4,401,833
PROCESS FOR THE PREPARATION OF 4-CHLORO-2,6-DIALKYLANILINES

Ulrich Schnegg, Leverkusen, and Karlfried Wedemeyer, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

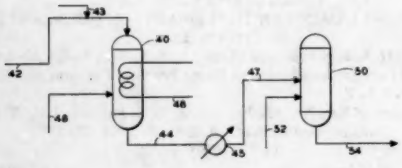
Filed Oct. 28, 1981, Ser. No. 315,767
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043206
Int. Cl.³ C07C *85/00*
U.S. Cl. 564—412 20 Claims

1. A process for the preparation of a 4-chloro-2,-6-dialkylaniline which comprises contacting the ammonium salt of a 2,6-dialkylaniline with a chlorination agent at −15° to +100° C. in the presence of an inert organic solvent and/or diluent and, thereafter, liberating 4-chloro-2,6-dialkylaniline from the corresponding 4-chloro-2,6-dialkylanilinium salt so-obtained.

4,401,834
PROCESS FOR PRODUCING ALCOHOLS

Terry S. King, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 1, 1982, Ser. No. 383,458
Int. Cl.³ C07C *29/14, 29/16, 29/88*
U.S. Cl. 568—881 9 Claims



1. An improved process for producing alcohols which comprises:

(a) passing a demetalled hydroformylation liquid effluent comprising aldehyde and alcohol and containing acetal impurities to a thermal treatment zone;

(b) subjecting said demetalled hydroformylation effluent in said thermal treatment zone in the absence of added acidic compounds and in the presence of water to a temperature of from about 350° to 500° F. for a time sufficient to convert at least a major portion of said acetal impurities to the corresponding aldehydes and alcohols and to form an aldehyde-containing liquid containing substantially reduced levels of said acetal impurities;

(c) withdrawing said aldehyde-containing liquid from said thermal treatment zone and rapidly cooling said liquid to a temperature of about 300° F. or below; and

(d) passing said cooled liquid to a hydrogenation zone for hydrogenation in the presence of a hydrogenation catalyst and gaseous hydrogen of at least a portion of said aldehydes to the corresponding alcohols at a temperature of from about 150° to 350° F.

4,401,835
METHOD FOR PREPARING SMALL SIZED BENZOYL PEROXIDE CRYSTALS

Arthur Tarasov, Upper Montclair, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 17, 1981, Ser. No. 303,229
Int. Cl.³ C07C *179/06*
U.S. Cl. 568—559 50 Claims

1. A method for preparing benzoyl peroxide in crystalline form with crystals having a size ranging up to about 10 microns, comprising:

forming a first solution comprising said benzoyl peroxide and a precipitate promoting material selected from sulfur-containing aliphatic ethers, long-chain aliphatic and araliphatic esters, ethylene oxide derivatives, and mixtures thereof;

adding said first solution to a second solution comprising an aqueous solution of a nontoxic and nonreactive dispersant, said dispersant selected from cellulosic derivatives, anionic surfactants, nonionic surfactants, inorganic colloidal materials, and mixtures thereof; and

recovering said benzoyl peroxide in said crystalline form.

4,401,836

MODIFIED POLYVINYL ALCOHOL AND ITS USE AS A SIZING AGENT

Friedrich Engelhardt, Frankfurt am Main, and Rolf Kleber, Neu-Isenburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,626

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109844

Int. Cl.[3] C08F 8/34

U.S. Cl. 525—61 4 Claims

1. A modified polyvinyl alcohol, obtained by reacting polyvinyl alcohol with formaldehyde and amidosulfonic acid in aqueous solution at a concentration of all three components of between 10 and 50% by weight and at a pH value of 4 to 7, which value is established by the addition of an organic amine.

4,401,837

EXO-TETRAHYDROTRICYCLOPENTADIENE, A HIGH DENSITY LIQUID FUEL

George W. Burdette, Ridgecrest, Calif., and Abraham I. Schneider, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1980, Ser. No. 155,879

Int. Cl.[3] C07C 5/22, 13/615; C10L 1/16

U.S. Cl. 585—253 3 Claims

1. A process for the preparation of a high density fuel for airbreathing engines consisting of exotetrahydrotricyclopentadiene (EXO-THTC) $C_{15}H_{22}$, which comprises:

distilling the trimer fraction of the reaction mixture from the product of heating dicyclopentadiene in a closed system at a temperature of about 165° C. to about 175° C. and for a period of time sufficient to maximize said trimer yield,

hydrogenating said trimer fraction in the presence of nickel-on-Kieselguhr catalyst to form tetrahydrotricyclopentadiene,

isomerizing said tetrahydrotricyclopentadiene by treatment with aluminum chloride at a temperature of from 0° C. to 20° C. in a methylene chloride solvent to form exo-tetrahydrotricyclopentadiene.

4,401,838

PURIFICATION OF HYDROCARBONS BY TREATMENT WITH POLYAMINES

George F. Balogh, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

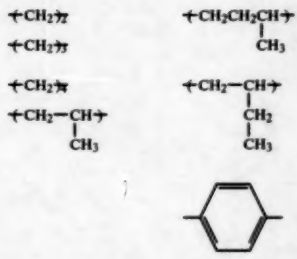
Filed Nov. 28, 1980, Ser. No. 210,931

Int. Cl.[3] C07C 7/10, 7/11; C10G 21/20

U.S. Cl. 585—860 11 Claims

1. A process for reducing the amount of carbon-disulfide in a hydrocarbon stream which comprises treating the hydrocarbon stream containing carbon disulfide with a polyamine with the general formula:

wherein R can be:



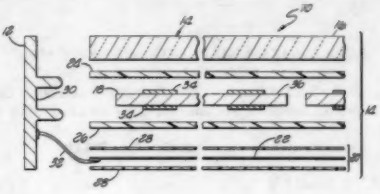
wherein x=0, 1, 2, 3, 4, 5 and y=0, 1, 2, 3, 4, 5 and wherein x and y cannot, at the same time, be 0, to form a reaction product which is a polyamine salt of dithiocarbamate and subsequently separating the product formed by the reaction of the polyamine and the carbon disulfide from the hydrocarbon stream.

4,401,839

SOLAR PANEL WITH HARDENED FOIL BACK LAYER

Bruce D. Pyle, Chatsworth, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 15, 1981, Ser. No. 331,119
Int. Cl.³ H01L 31/04
U.S. Cl. 136—251 11 Claims



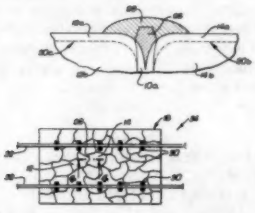
2. A solar panel comprising:
at least one solar cell;
a rigid transparent sheet overlying the cell; and
a sheet of hardened aluminum foil beneath the cell and bonded to the cell and to the transparent sheet.

4,401,840

SEMICRYSTALLINE SOLAR CELL

Sanjeev R. Chitre, Tempe, Ariz., assignor to Photowatt International, Inc., Tempe, Ariz.

Filed Jul. 22, 1981, Ser. No. 285,787
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—258 22 Claims



1. A solar cell comprising: a semicrystalline structure having a plurality of grain areas of differing crystalline orientation and grain boundaries separating the differing grain areas; a p-n junction formed in the semicrystalline structure; and a conductive metallic region formed at the grain boundaries (a) for collecting generated carriers from the structure before the carriers recombine at the grain boundaries, and (b) for shielding the grain boundaries from light thereby to further passivate the grain boundaries, said metallic region being formed by anodic etching at the grain boundaries and cathodic displacement of atoms at the grain boundaries with metallic atoms.

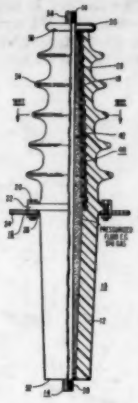
4,401,841

EXPLOSION RESISTANT INSULATOR AND METHOD OF MAKING SAME

Jeffry R. Meyer, Penn Hills; John S. Billings, Jr., Trafford; Harvey E. Spindle, Wilkins Township, Allegheny County, and Charles F. Hofmann, Export, all of Pa. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Jan. 23, 1981, Ser. No. 228,017
Int. Cl.³ H01B 17/26, 17/36
U.S. Cl. 174—31 R 11 Claims

1. An electrical insulator assembly, comprising:
(a) a body member formed of a cast electrical insulating material; and
(b) an open mesh web reinforcement member being embedded in said body member, said web reinforcement member having a corrugated tubular configuration to allow movement of said open mesh web reinforcement member without tearing upon fracture of said cast electrical insulating material so that said open mesh web reinforcement member will limit displacement of fragments of said cast electrical insulating material.

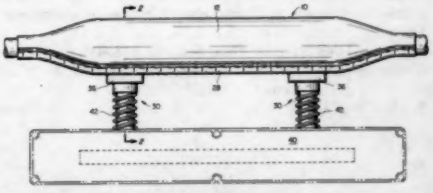


4,401,842

HEAT RECOVERABLE CLOSURE DEVICE HAVING CRACK PROPAGATION PREVENTION MEANS

John S. Mattis, Sunnyvale; Eleazar F. Ramirez, San Jose, and Michael J. Vrcelj, Cupertino, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 20, 1981, Ser. No. 285,246
Int. Cl.³ H02G 15/18
U.S. Cl. 174—71 R 11 Claims

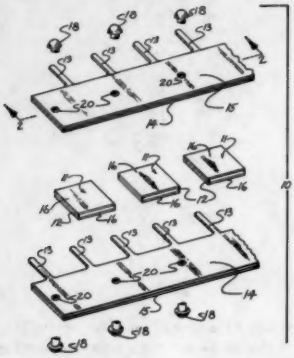


1. A closure device comprising:
a heat-recoverable tubular member having at least one opening in the heat-recoverable portion of the tubular member defining a means for readily communicating with articles contained in the tubular member; and
compression means attached generally normal to and adjacent each portion of the tubular member having an opening for preventing heat-recovery crack propagation, the compression means including means for maintaining the compression means in constant compression during heat recovery, exerting a continuous, radially inward, generally normal force against the portion of the tubular member adjacent each opening.

4,401,843
MINIATURIZED BUS BARS AND METHODS OF FABRICATION THEREOF

William P. Harper, Phoenix, and Donald H. DeVries, Mesa, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed Mar. 31, 1981, Ser. No. 249,640
Int. Cl.³ H01B 5/00
U.S. Cl. 174—72 B 20 Claims

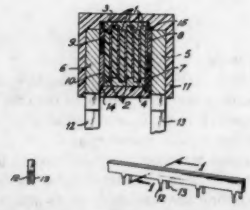


1. A high capacitance bus bar assembly comprising:
at least two spatially separated bus bar conductors having inwardly facing planar surfaces;
a plurality of capacitors, said capacitors being arranged linearly and positioned between said bus bar conductors, said capacitors each comprising a dielectric material disposed between a pair of oppositely disposed planar conductive outer surfaces, said conductive outer surfaces of said capacitors facing outwardly and being in electrical contact with respective of said bus bar conductor inwardly facing surfaces; and
means for applying a mechanical force which urges said bus bar conductor inwardly facing surfaces against and into electrical contact with said capacitors conductive outer surfaces.

4,401,844
POWER SUPPLY BAR COMPRISING A STACK OF 2 N METAL LAYERS SEPARATED BY 2 N DIELECTRIC LAYERS

Daniel Fleuret, Paris, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Nov. 24, 1981, Ser. No. 324,608
Claims priority, application France, Nov. 28, 1980, 80 25270
Int. Cl.³ H01B 7/00
U.S. Cl. 174—72 B 16 Claims

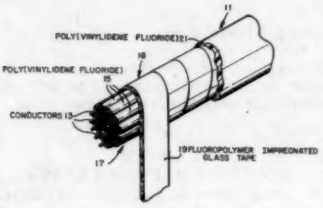


1. A low characteristic impedance bus-bar for transmitting an electric signal from a source to a plurality of receivers, said bus-bar comprising two conducting bars conveying the signal, separated by dielectric means formed by a stack of metal-coated dielectric films forming an assembly of 2 n dielectric films separated by 2 n metal layers, the metal layers of even and uneven rows being respectively connected together laterally by electric connections, said conducting bars being secured on each side of the stack and connected electrically respectively to one of said lateral electric connections.

4,401,845
LOW SMOKE AND FLAME SPREAD CABLE CONSTRUCTION

Oliver R. Odhner, Limerick, and Joseph W. Michaud, Devon, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 26, 1981, Ser. No. 296,102
Int. Cl.³ H01B 7/02
U.S. Cl. 174—113 R 6 Claims



1. A low smoke and flame retardant jacketed cable comprising a bundle of conductors having insulating layers comprised of a poly(vinylidene fluoride) resin, a wrapping which includes a fluorinated polymer impregnated glass tape on said bundle, and a polymer jacket comprising a poly(vinylidene fluoride) resin wherein the weight ratio of total poly(vinylidene fluoride) resin to fluorinated polymer impregnated glass tape in said cable is from about 6 to 1 to about 33 to 1.

4,401,846
DEVICE ADAPTED FOR SUPPORTING CONDUCTORS, AND THE COMBINATION OF THE CONDUCTORS AND THE SUPPORTING DEVICE

Takayuki Sato, Akikawa, and Akira Tanaka, Kawashima, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 7, 1980, Ser. No. 194,860
Claims priority, application Japan, Oct. 9, 1979, 54-129406; Apr. 21, 1980, 55-51706
Int. Cl.³ H02G 5/00
U.S. Cl. 174—149 B 18 Claims

1. An insulating support device adapted to support at least one conductor having a hole therein, comprising:
at least two hollow tubular insulating support members, each said tubular support member including a partition located inside said support member, said partition including a circular hole therein, said circular hole being concentric with said tubular support member, said pair of support members adapted to be disposed adjacent opposing sides of said conductor with the partition holes of said support members adapted to be arranged coaxially with the conductor hole;
an elongated insulating tube passing through said partition holes of said pair of support members and adapted to pass through said conductor hole; and
a support rod passing through said insulating tube;
wherein said pair of support members are in a free relationship with said support rod;
wherein each said hollow tubular insulating support member comprises,
first and second elongated half sections, each half section

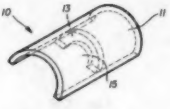
having a semi-annular shaped cross-section, each half section including two semi-annular shaped end surfaces and two longitudinal edge surfaces, each half section including a semi-annular shaped partition located therein, said first and second half sections being joined at their respective edge surfaces to form an essentially hollow cylinder, and

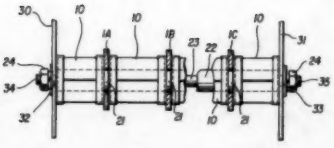
first and second circular end caps, each of said end caps including a concentric hole therein and a raised edge portion about its periphery, each of said end caps being coupled to said essentially hollow cylinder such that said raised edge portion surrounds a portion of an outer peripheral surface of said essentially hollow cylinder.

10. In combination, a plurality of parallel conductors each including a hole therein, each of said holes in said plurality of parallel conductors having a common axis, and a device for supporting said conductors, wherein said device comprises:

a first bracket member including a first hole therein;

a second bracket member including a second hole therein, said first and second holes being aligned with said common axis, said first bracket member being located on a first side of said plurality of parallel conductors and said second bracket member being located on a second side of said plurality of conductors to position said plurality of parallel conductors therebetween;





an elongated cylindrical insulating member passing through said holes in said plurality of conductors, said insulating member including a longitudinal hole passing therethrough;

a support member positioned in said longitudinal hole in said insulating member, said support member passing through said holes in said first and second bracket members;

fastening means for attaching said support member to said first and second bracket members; and

a plurality of hollow tubular insulating supports surrounding said elongated insulating member, one of said insulating supports being located between each of said plurality of conductors, one of said insulating supports being located between a first one of said conductors and said first bracket member, and one of said insulating supports being located between a second one of said conductors and said second bracket member;

wherein each of said tubular insulating supports includes a centrally located partition therein, said partition including a hole therein, said support member passing through said hole in said partition and being in a free relationship therewith, such that a tensile force applied to said support member due to an electromagnetic force associated with said conductors does not act on said tubular insulating supports;

wherein said hole provided in the centrally located partition of each of said insulating supports is concentric with said tubular insulating support, and

wherein at least one of said hollow tubular insulating supports comprises,

first and second elongated half sections, each half section having a semi-annular shaped cross-section, each half section including two semi-annular shaped end surfaces and two longitudinal edge surfaces, each half section including a semi-annular shaped partition located therein, said first and second half sections being joined at their respective edge surfaces to form an essentially hollow cylinder, and

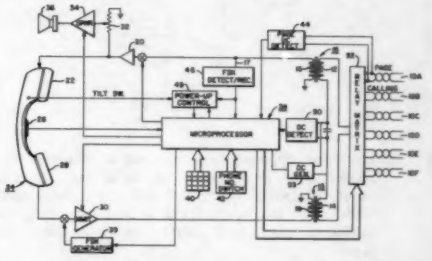
first and second circular end caps, each of said end caps including a concentric hole therein and a raised edge portion about its periphery, each of said end caps being coupled to said essentially hollow cylinder such that said raised edge portion surrounds a portion of an outer peripheral surface of said essentially hollow cylinder.

4,401,847

TELEPHONE COMMUNICATION SYSTEM

Alan A. Schneider, Reisterstown; Ronald J. Flower, Hampstead; George C. Bowser, Reisterstown, all of Md., and Lewis C. Kenyon, Worchester, Mass., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed Jul. 30, 1980, Ser. No. 173,622
Int. Cl.³ H04M 9/06
U.S. Cl. 179—1 H **19 Claims**



1. In a telephone communication system of the type wherein a plurality of stations are adapted to communicate over any one of a plurality of conductors connected to each of the stations without the need for a central switching and control station, the combination of means at each of said stations for establishing communication between it and another station in the system over a selected one of said conductors, and means at each station for impressing a direct current bias on a conductor through which it has established communication with another station such that all other stations in the system will be apprised that a particular conductor interconnecting two stations is in use.

4,401,848

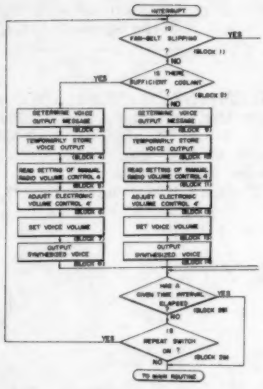
VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Masakazu Tsunoda, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 3, 1980, Ser. No. 193,813
Claims priority, application Japan, Oct. 4, 1979, 54-127355
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SM **10 Claims**

1. A voice warning system for informing a driver of an automotive vehicle, provided with a radiator filled with coolant and with a fan belt for driving a fan, of an overheat condition and of corrective actions to be taken, which comprises:

(a) a coolant temperature sensing means for outputting a coolant temperature signal S_t only when coolant temperature exceeds a predetermined temperature;
(b) a fan-belt slippage sensing means for outputting a fan-belt slippage signal S_f only when the fan belt is slipping;
(c) a radiator coolant level sensing means for outputting a radiator level signal S_r only when coolant level in the radiator is below a predetermined level;
(d) a microcomputer means connected to said coolant temperature sensing means, to said fan-belt slippage sensing means, and to said radiator coolant level sensing means, said microcomputer means operatively connected to said sensing means for periodically checking for the presence of the coolant temperature signal S_t and, in response to the presence of the coolant temperature signal S_t, for sequentially checking for the presence of the fan-belt slippage signal S_f and the radiator coolant level signal S_r, said microcomputer means



determining appropriate voice output messages in response to the presence or absence of the coolant temperature signal S_t, the fan-belt slippage signal S_f and the radiator coolant level signal S_r, and outputting voice output message signals corresponding to the detected signals;
(e) a voice synthesizer means connected to said microcomputer means for indicating the occurrence and causes of an overheat condition by synthesizing voice output messages in response to the voice output message signals output from said microcomputer, and
(f) a loudspeaker connected to said voice synthesizer means for outputting voice output messages synthesized by said synthesizer means for indicating to the vehicle driver of both the overheat condition and the corrective actions to be taken for correcting the overheat condition.

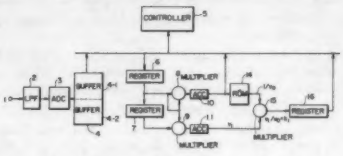
4,401,849

SPEECH DETECTING METHOD

Akira Ichikawa, Musashino; Nobuo Hataoka, Hachiouji; Yoshiaki Kitazume, Sayama, and Eiji Ohira, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,677
Claims priority, application Japan, Jan. 23, 1980, 55-5690
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SC **6 Claims**

1. A speech detecting method comprising the first step of extracting a zero-order auto-correlation coefficient and a first-order partial auto-correlation coefficient from every fixed extraction interval of an input signal, and the second step of determining whether or not said input signal is a speech signal depending upon whether or not either a first state under which said zero-order auto-correlation coefficient is greater than a first threshold value or a second state under which said zero-order auto-correlation coefficient is greater than a second threshold value and wherein said first-order partial auto-correlation coefficient is smaller than a third threshold value continuously or intermittently at least for a predetermined number of the extraction intervals.

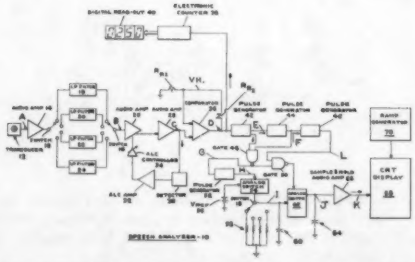


4,401,850

SPEECH ANALYSIS APPARATUS

William D. Harbeson, Boonton, N.J., assignor to Kay Elemetrics Corp., Pine Brook, N.J.

Continuation-in-part of Ser. No. 73,201, Sep. 7, 1979, Pat. No. 4,276,445. This application Feb. 23, 1981, Ser. No. 237,320
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SC **3 Claims**

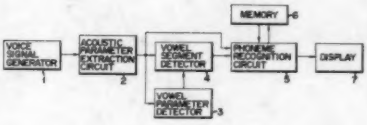


1. Speech analysis apparatus comprising, transducer means for converting speech sounds into electrical signals, low pass filter means connected to said transducer means for extracting on a real time, cycle-to-cycle basis the fundamental pitch frequency from the electrical signals representing the speech sounds, said filter means having a signal attentuation characteristic that is flat for low frequencies up to a selected frequency level and effects an increasing reduction of signal level with pitch frequencies above said selected level of between 13 decibels per octave and 15 decibels per octave in order to compensate for the increase in signal energy with speech pitch and to subtract second and higher voice frequency harmonics from said electrical signals, frequency-to-voltage generator means responsive to said low pass filter means for generating a voltage whose amplitude is a function of the fundamental pitch frequency extracted from said electrical signal, and means for displaying on a real time, cycle-to-cycle basis the output of said frequency-to-voltage generating means.

4,401,851
VOICE RECOGNITION APPARATUS

Tsuneo Nitta, Yokohama; Toshitake Murata, Tokyo; Hiroyuki Tsuboi, Yokohama, and Takashi Kondo, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 2, 1981, Ser. No. 239,647
Claims priority, application Japan, Jun. 5, 1980, 55-75968
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SD 13 Claims



1. A speech recognition apparatus comprising:

speech signal generating means for generating a speech signal based on spoken words including at least a consonant and a vowel following the consonant;

acoustic parameter data extracting means for extracting acoustic parameter data from the speech signal, including memory means for time-sequentially storing acoustic parameter data;

vowel detecting means for obtaining a vowel parameter data and a vowel address thereof, which includes receiving means for sequentially receiving acoustic parameter data from said memory means, correlator means for choosing from among the acoustic parameter data received by said receiving means a vowel parameter data which most exhibits predetermined vowel characteristics usable for vowel recognition, and vowel address detecting means for detecting an address of the vowel parameter data in said memory means;

boundary detecting means for detecting at least one of starting and end points of a vowel segment to detect a boundary address corresponding to the boundary between the consonant and vowel in the speech signal, which includes address designating means for sequentially designating the address of the acoustic parameter data in said memory means, said address designating means initially storing address data designating an acoustic parameter data adjacent to the vowel parameter data designated by the vowel address detected by said vowel address detecting means, means for sequentially changing the address of said address designating means, thereby causing the acoustic parameter data to be sequentially read out from said memory means, similarity calculating means for sequentially calculating a similarity between each of the acoustic parameter data sequentially read out from said memory according to an address signal from said address designating means and the vowel parameter data obtained by said vowel parameter detecting means, and boundary address detecting means for detecting the boundary address by receiving the address from said address designating means which is generated when the similarity calculated by said similarity calculating means has reached a predetermined reference value of similarity;

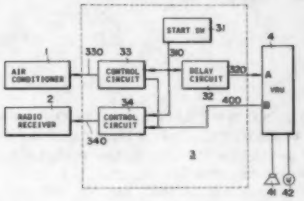
reading means for reading out a group of acoustic parameter data from said memory means starting from the boundary address derived from said boundary address detecting means; and

phoneme recognition means for recognizing a phoneme based on the acoustic parameter data read out by said reading means.

4,401,852
VOICE RESPONSE CONTROL SYSTEM

Kazunori Noso, Yokosuka; Hiroshi Yano, Higashiyamato; Norimasa Kishi, and Yasuhisa Takeuchi, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 13, 1982, Ser. No. 339,165
Claims priority, application Japan, Jan. 14, 1981, 56-3241
Int. Cl.³ G10L 1/04
U.S. Cl. 179—1 VC 15 Claims



1. A voice response control system for use in an automotive vehicle, comprising:

(a) A voice recognition unit for recognizing a voice instruction given thereto and operating at least one component installed on said automotive vehicle in accordance with the given voice instruction, said voice recognition unit generating a completion signal at the termination of recognition of the given voice instruction; and

(b) a control unit for controlling at least one sounding device generating a sound during its operation, said control unit including:

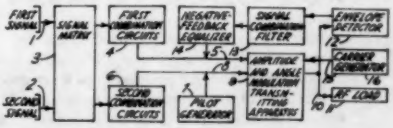
a start signal generator having a start switch for generating a start signal when said start switch is turned on; and

control means, responsive to the start signal from said start pulse generator, for reducing the level of the sound from said sounding device to a predetermined value sufficient to ensure correct voice instruction recognition of said voice recognition unit, said control means generating a control signal to said voice recognition unit to thereby place the same in a condition waiting for a voice instruction after the level of the sound from said sounding device falls to the predetermined value, said control means, responsive to the completion signal from said voice recognition unit, for causing said sounding device to return to its initial sound level.

4,401,853
AM QUADRATURE STEREO SYSTEMS

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec H3H 1T1, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec H3R 1K3, both of Canada

Filed Aug. 23, 1982, Ser. No. 410,313
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GS 9 Claims



1. The method of stereo transmission which comprises:

receiving a first signal, and

receiving a second signal, and

generating a carrier of substantially constant amplitude and constant frequency, and

generating a pilot of substantially constant amplitude and constant frequency, and

forming in-phase sidebands on said carrier by a first combination of said first and said second signals, predistorted to substantially cancel subsequent distortion of said first combination in an envelope detector, due to the presence of quadrature sidebands, and

forming said quadrature sidebands on said carrier by a second combination of said first and said second signals, and by said pilot, and

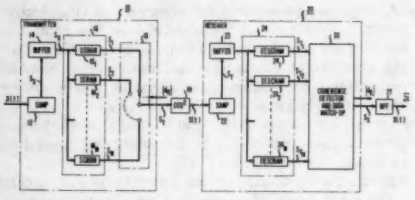
delivering said carrier, said in-phase and said quadrature sidebands to a load circuit.

4,401,854

SIMULTANEOUS TRANSMISSION OF AN ANALOG MESSAGE SIGNAL AND A DIGITAL DATA SIGNAL

Raymond Steele, Hazlet, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 3, 1981, Ser. No. 289,835
Int. Cl.³ H04K 1/02
U.S. Cl. 179—1.5 R **19 Claims**



14. A method of simultaneously achieving secure transmission of an analog signal (x(t)) and an n-length data sequence (d_i) from a data stream ($\{d_k\}$), the method comprising the steps of:

a. multiplexing the analog signal and the digital data stream to form a coded sequence (S_T),

b. transmitting the coded sequence,

c. receiving the coded sequence; and

d. demultiplexing the received coded sequence to recover both the analog signal and the digital data stream,

characterized in that

the method comprises the further steps of

e. in performing step (a), performing the steps of:

1. scrambling the analog signal utilizing M unique scrambling processes, where $M=2^n$, to form M unique scrambled sequences (S_1–S_M),

2. associating the M scrambled sequences formed in step (e)(1) in a one-to-one relationship with a set of the 2^n possible combinations of the n-length data sequences that could be transmitted, and

3. defining the coded sequence (S_T) as one of the M sequences of step (e)(1) associated in step (e)(2) with a current n-length data sequence desired to be transmitted; and

f. in performing step (d), performing the steps of:

1. simultaneously descrambling the received coded sequence by M unique processes, each separate process related to the inverse of a separate one of the M unique scrambling processes in step (e)(1) to form M descrambled sequences (S_{T1}–S_{TM}), and

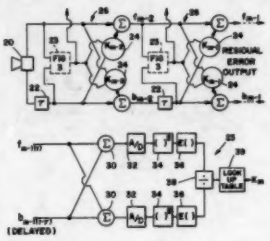
2. comparing known statistical coherence properties of the M descrambled sequences formed in step (f)(1) and producing as separate outputs the most coherent descrambled sequence and the n-length data element associated therewith.

4,401,855

APPARATUS FOR THE LINEAR PREDICTIVE CODING OF HUMAN SPEECH

Robert W. Broderson, Oakland; Paul J. Hurst, San Leandro, and Ronald D. Fellman, Berkeley, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 28, 1980, Ser. No. 211,115
Int. Cl.³ G10L 1/06
U.S. Cl. 179—15.55 R **5 Claims**



1. In apparatus for the linear predictive coding of human speech in which analog data processing and LPC computations are performed on said speech, the improvement wherein:

(a) switched capacitor filter means comprising a plurality of multiplexed low pass filters is used for performing said analog data processing, and

(b) digital circuitry is used for performing said LPC computations, said switched capacitor filter means and said digital circuitry being implemented on one or more silicon chips,

and wherein said digital circuitry comprises an analog to digital converter connected to a digital delay line and a multiplying digital to analog converter, said speech providing the input to said analog to digital converter and digital delay line and an input to said multiplying digital to analog converter and the output of said delay line providing the other input to said multiplying digital to analog converter, the output of said multiplying digital to analog converter providing the input to said plurality of multiplexed low pass filters, whereby the output of said plurality of multiplexed low pass filters are the autocorrelation values of said speech.

4. In apparatus for the linear predictive coding of human speech in which analog data processing of said speech and LPC computations based upon said analog data processing are performed, the improvement wherein:

(a) switched capacitor filter means is used for performing said analog data processing of said speech, said filter means being a lattice adaptive filter structure the operation of which in terms of a given vocal tract modeled as a cascade of equal length tubes each having a cross-sectional area independently varying in terms is described by the equations:

$$f_m(t)=f_{m-1}(t)-k_m b_{m-1}(t-\tau)$$

$$b_m(t)=b_{m-1}(t-\tau)-k_m f_{m-1}(t)$$

where f_m is a forward traveling sound pressure wave in a given one of said cascade of equal length tubes, b_m is a backward traveling sound pressure wave in said given one of said cascade of equal length tubes, f_{m-1} is a forward traveling sound pressure wave in an adjacent one of said cascade of equal length tubes, b_{m-1} is a backward traveling wave in said adjacent one of said cascade of equal length tubes, (t) is a given time, τ is twice the amount of time required for said forward sound pressure wave to travel through said given tube of said cascade of equal length tubes and k_m is the negative of the reflection coefficient of a sound wave as it encounters the discontinuity at

the junction between said given tube and said adjacent tube of said cascade of equal length tubes; and

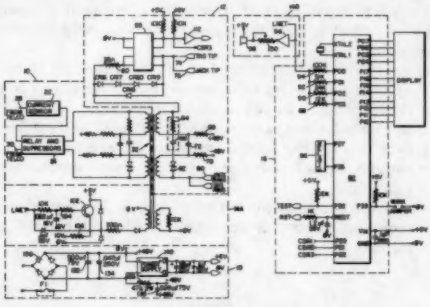
(b) digital circuitry is used for performing said LPC computations based upon said analog data processing of said filter means, said switched capacitor filter means and said digital circuitry being implemented on one or more silicon chips.

4,401,856

CONTROL SYSTEM FOR HANDLING DIRECT INWARD DIALED TELEPHONE CALLS

William J. Curtin; Paul N. Henning, and Kendall E. Post, all of Madison, Wis., assignors to Amtel Communications, Inc., Madison, Wis.

Filed May 13, 1981, Ser. No. 263,284
Int. Cl.³ H04M 3/50, 3/54
U.S. Cl. 179—27 FH 17 Claims



1. A control system capable of being coupled to a single access line from a telephone central office, such single access line being coupled at a telephone central office to a block of telephone number lines, and said control system enabling a telephone answering system to answer and identify incoming direct inward dialed telephone calls received on the single access line, said control system comprising:

a microprocessor controlling means associated with only the single access line coupled to said control system for controlling the operation of said control system;

coupling means for coupling said control system to a single access line that receives direct inward dialed telephone calls from a telephone central office, said coupling means including: an input terminal capable of being coupled to the single access line from the telephone central office; a current sensor for bidirectional current sensing of a signal received from the access line at said input terminal and said current sensor having output terminals coupled to said microprocessor controlling means for enabling said microprocessor controlling means to monitor the current of a signal received at said input terminal; transformer coupling means for coupling signals received from the access line to said operator answering means; and relay means for interconnecting said transformer coupling means and said current sensor;

an operator answering means for enabling an operator at the site of the telephone answering system to be coupled to incoming calls on the access line;

decoding means for decoding at least the last digit of a telephone number being called by an incoming call; and,

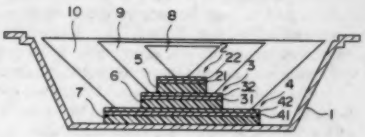
identification means for identifying a particular telephone number line being called by an incoming call on the access line.

4,401,857

MULTIPLE SPEAKER

Eiji Morikawa, Neyagawa, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Nov. 19, 1981, Ser. No. 323,093
Int. Cl.³ H04R 17/00, 17/06
U.S. Cl. 179—110 A 16 Claims



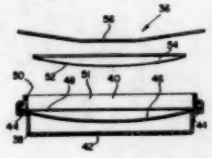
1. A multiple speaker comprising a plurality of transducing units, each including a speaker diaphragm having a diameter different from that of the counterpart in another transducing unit and a piezoelectric element connected to the smaller end portion or apex of the speaker diaphragm, the individual piezoelectric elements being securely placed one upon another, with a cushioning member interposed between each two adjacent piezoelectric elements, so that the transducing units are coaxially or multi-axially arranged.

4,401,858

METHOD FOR CONTROLLING WRINKLES IN A VIBRATILE DIAPHRAGM

John M. Reynard, Framingham; Thomas N. Carignan, Danvers; Richard Paglia, Carlisle, and Joseph R. Rich, Danvers, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 113,581, Jan. 21, 1980, abandoned, which is a division of Ser. No. 900,016, Apr. 25, 1978, Pat. No. 4,215,249. This application Mar. 24, 1981, Ser. No. 247,124
Int. Cl.³ H04R 19/00
U.S. Cl. 179—111 R 1 Claim



1. A method for mounting a diaphragm in an electroacoustical transducer assembly of the type having a housing member with an opening therein, an electrostatic vibratile diaphragm formed of a pliant, relatively inelastic material having a conductive and a nonconductive surface, a substantially inflexible backplate member having a grooved surface and a spring, comprising the steps of;

placing said diaphragm adjacent said housing member such that said diaphragm extends across said housing member opening;

applying uniform, radially outward forces to said diaphragm for the purpose of temporarily maintaining at least the inner region of said diaphragm in a generally wrinkle-free planar orientation;

placing the grooved surface of said backplate member in contact with an inner region of the insulative surface of said diaphragm;

applying a force to said backplate member, in excess of said radial forces on said diaphragm, for the purpose of offsetting said inner diaphragm region from its said planar orientation to thereby increase the total amount of said

diaphragm extending across said housing opening over that extending across said housing opening before the application of said inner region offsetting force, said offsetting force overcoming said radial forces, thereby enabling additional amounts of said diaphragm to move uniformly inward as said inner diaphragm region is being so offset;

securing an outer region of said diaphragm in a fixed position with respect to said housing member while said inner diaphragm region is in its said offset condition; and

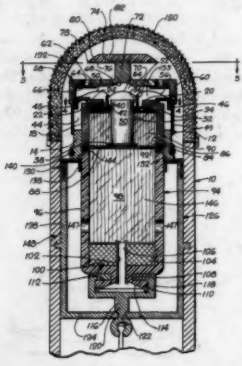
inserting said spring into said assembly such that portions of said spring are reacted against said housing member and a portion of said spring presses on said backplate member to maintain said grooved portion of said backplate in contact with a portion of said offset inner diaphragm region.

4,401,859

DIRECTIONAL MICROPHONE WITH HIGH FREQUENCY SELECTIVE ACOUSTIC LENS

Alan R. Watson, Niles, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed May 29, 1981, Ser. No. 268,376
Int. Cl.³ H04R *1/32*
U.S. Cl. 179—121 D **7 Claims**



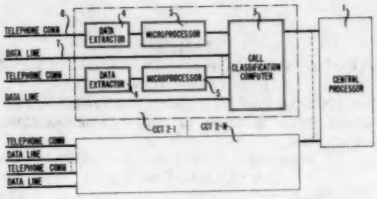
1. A microphone having a frequency response range extending to an upper limit frequency comprising, in combination: an electroacoustical transducer having a hollow casing with an opening to the exterior thereof, a diaphragm disposed in a plane and acoustically sealed across the opening to receive sound waves from exterior of the casing, said transducer producing an electrical output responsive to deflection of the diaphragm; a shell mounted on the casing confronting the diaphragm, said shell having a wall spaced from and confronting the diaphragm provided with an aperture therein, the aperture having a cross section no greater than one-fourth wavelength, and a diffraction plate mounted on the shell forming an acoustic lens with a focal point for upper limit frequencies on the side of the wall of the shell opposite the lens, said plate having a cross sectional dimension between 0.3 wavelengths and 1.5 wavelengths at said upper limit frequency, said plate being spaced from the wall of the shell by a distance less than the focal length of the lens at said upper limit frequency, and the aperture in the wall of the shell being disposed on an axis between the edge of the plate and the focal point of the acoustic lens at said upper limit frequency, said aperture being partially shadowed by the plate for incident sound waves traveling on an axis normal to the plane of the diaphragm.

4,401,860

FREQUENCY SIGNALING METHOD AND APPARATUS WITH DYNAMIC COMPENSATION FOR FREQUENCY ERRORS

Jim E. Walls, Bexley, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1982, Ser. No. 344,225
Int. Cl.³ H04M *3/24*
U.S. Cl. 179—175.2 C **29 Claims**



19. A tone signal receiver arranged to compensate dynamically for frequency error in the generation of sinusoidal signals comprising

means (4,5) for measuring the frequencies of each of a plurality of incoming signals in which one of the signals is a reference signal having a defined frequency,

means for calculating a correction factor based on the difference between the defined frequency of the reference signal and the actual frequency of the received reference signal, and

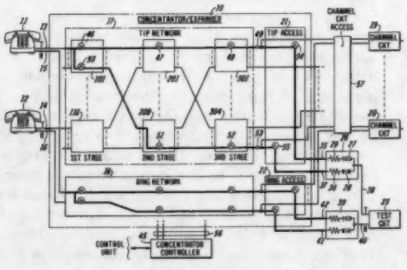
means for adjusting the actual frequency of each of the remaining signals in accordance with said correction factor.

4,401,861

SEMICONDUCTOR CROSSPOINT LINEARIZING ARRANGEMENT

Arthur R. Braun, Englewood, Colo., and Robert E. Poignant, Oswego, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 10, 1981, Ser. No. 291,277
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—175.3 R **13 Claims**



1. A switching network having input ports and output ports, said switching network comprising:

a plurality of crosspoints, each of said crosspoints having relatively nonlinear conduction characteristics when conducting a current less than a predetermined current and having relatively linear conduction characteristics when conducting a current in excess of said predetermined current;

control means for controlling the crosspoints of said switching network to establish separate conduction paths be-

tween a first one of said input ports and a first selected pair of said output ports; and

linearizing means connected to said first selected output ports for transmitting a current in excess of said predetermined current from one of said first selected output ports to the other of said first selected output ports;

wherein said linearizing means comprises a DC voltage supply connected in series with a resistance between said one of said first selected output ports and said other of said first selected output ports.

4,401,862

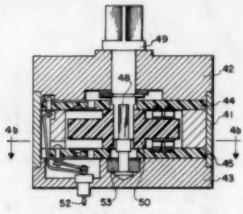
ELECTRICAL SWITCH WITH SLIDING CONTACTS

Bernard Valentin, Max-Planck-Strasse 14a, D-8900 Augsburg 21, and Ernst Heinl, Birkenweg 30, D-8051 Unterzolling, both of Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,465

Int. Cl.³ H01H *1/12, 19/02, 21/02, 15/02*

U.S. Cl. 200—11 K **10 Claims**



9. An electrical switch comprising

at least two stationary contact members, said contact members mounted on opposite sides of said support, said support forming an insulation support member on each side of said contact members, and

movable contact members engaging each of said stationary contact members and being slidable along the surface of each to provide an electrical connecting circuit, said movable contact member engaging said insulation support member and being slidable along said insulation support member on each side of each of said stationary contact members to provide an open electrical circuit,

said insulation support member having a recess area between parallel sides of said support member beyond said stationary contact members for collecting material resulting from the engagement wear of said movable contact member engaging said stationary contact members.

4,401,863

CONTACT DEVICE FOR LOW VOLTAGE SWITCH DEVICES

Helmut Lemmer, and Kurt Breidenbach, both of Marienheide, Fed. Rep. of Germany, assignors to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Filed Aug. 14, 1981, Ser. No. 292,826

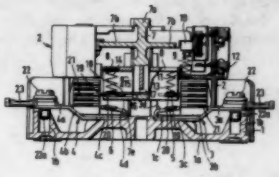
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033668

Int. Cl.³ H01H *9/30, 15/00, 1/00*

U.S. Cl. 200—16 A **29 Claims**

1. In a contact device for low voltage switching devices of the type including a housing, at least two stationary contact bars each having a stationary contact piece, a contact bridge support disposed in the housing and at least one electrically conductive contact bridge which is disposed in the contact bridge support and is movable by means of a spring force, the improvement comprising:

said contact bridge being made of a flexible material and having two movable contact pieces arranged to impact on said stationary contact pieces, respectively, each movable contact piece having a separate contact pressure spring associated therewith disposed between said contact bridge support and said contact bridge, and exerting said spring force on said contact bridge, whereby upon said contact



pieces impacting with one another the force of impact of said contact pieces and the weight of said contact device is substantially reduced compared to contact devices made of rigid material.

4,401,864

SEESAW TYPE SWITCH MECHANISM

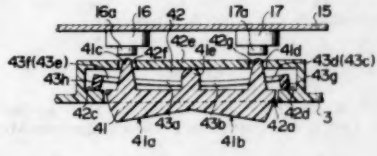
Hiroki Ichikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,908

Claims priority, application Japan, Jul. 10, 1980, 55-97106[U]; Jul. 10, 1980, 55-97107[U]; Jul. 10, 1980, 55-97108[U]; Jul. 10, 1980, 55-97109[U]; Jul. 10, 1980, 55-97110[U]

Int. Cl.³ H01H *3/00, 13/00*

U.S. Cl. 200—17 R **28 Claims**



1. A seesaw type switch mechanism comprising:

an operating member rockably disposed in a recess and having a pair of tabs formed on its outer surface in its left- and right-hand halves for causing an angular movement of the operating member in opposing directions, the operating member carrying spaced apart protuberances on the rear surface thereof, each being in alignment with one of the respective tabs for operating an associated switch;

switch members disposed on paths of movement of the protuberances for cooperation therewith, each of the switch membes being adapted to perform a switching operation as it is acted upon by one of the protuberances when the operating member is angularly driven;

the base of said recess forming a stationary wall separating said switch members from said operating member; and resilient return means positioned in said recess and being remote from said switch member and said protuberances and compressible by said operating member for returning the operating member to its original position where said stationary wall keeps the switch members clear from either protuberance and said return means after the force for angularly driving the operating member and compressing said return means is removed.

4,401,865

STRIP MATERIAL OUTER TURN PROXIMITY SWITCH DETECTION APPARATUS

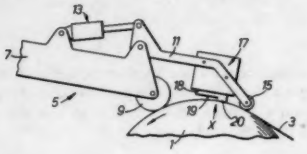
David C. Benoy, Swanage, England, assignor to Loewy Robertson Engineering Co. Ltd., Poole, England

Filed Sep. 9, 1981, Ser. No. 300,476

Claims priority, application United Kingdom, Sep. 12, 1980, 8029532

Int. Cl.³ B65H 25/14

U.S. Cl. 200—61.13 20 Claims



1. Apparatus for detecting the position of the end of the outer turn of a coil of strip material rotatably supported with its axis substantially horizontal, comprising:

a detector assembly including a housing, means mounting a proximity switch upon said housing such that said proximity switch is normally spaced from the peripheral surface of said coil of strip material, and means mounting a projection upon said housing projecting outwardly of said housing so as to be disposed nearer to said peripheral surface of said coil of strip material than said proximity switch, said proximity switch being disposed downstream of said projection as considered in the winding direction of said coil of strip material; and

means for causing said end of said outer turn of said coil of strip material to move toward and thereby actuate said proximity switch after said end of said outer turn of said coil of strip material has passed beyond said projection when said outer turn of said coil of strip material is being wound upon said coil of strip material.

4,401,866

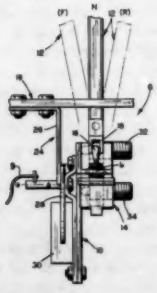
LEVER CONTROL APPARATUS

David C. Kaminski, Sylvania, and William H. Graumlich, Toledo, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed May 21, 1981, Ser. No. 267,481

Int. Cl.³ H01H 9/06

U.S. Cl. 200—61.88 8 Claims



1. A control apparatus comprising:

(a) a gear ratio lever pivotally moveable about a first axis,

(b) a multiple position switch fixed to and moveable with said gear ratio lever, said switch including a toggle, said toggle limited to perpendicular movement with respect to said first axis, and

(c) a control lever pivotally moveable about a second axis, said second axis perpendicular to said first axis, said control lever connected to said ratio lever and perpendicularly moveable with respect to said first axis, said control lever comprising means for moving said toggle transversely to the movement of said gear ratio lever.

4,401,867

SWITCHING DEVICE WITH FORCED OPENING OF THE CONTACTS

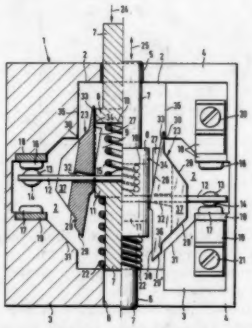
Heinz Grunst, Marienheide, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,756

Claims priority, application European Pat. Off., Oct. 24, 1980, 80 106511.1

Int. Cl.³ H01H 21/40, 15/18

U.S. Cl. 200—76 9 Claims



1. A switching device comprising a housing and within the housing a control plunger guided for reciprocating movement; at least one passage formed in a central part of the plunger transversely to the direction of its movement; a contact bridge arranged in said passage and having contact arms projecting at both sides of the plunger; at least one pair of stationary contacts mounted in the housing opposite the projecting arms of said contact bridge; a first tension spring provided in said passage to urge said contact bridge against said plunger; a second spring arranged between said plunger and said housing to bias the plunger in a switching position in which said contact bridge engages said stationary contacts; and detaching means supported on said contact bridge, said detaching means having at least one arresting projection engageable with said plunger when the latter is displaced from its switching position and the contact bridge accidentally adheres to the stationary contacts, and abutment surfaces cooperating with said housing to disengage the detaching means from said plunger when said contact arm has been separated from said stationary contacts.

4,401,868

VACUUM INTERRUPTER WITH A SPACIALLY MODULATED AXIAL MAGNETIC FIELD CONTACT

Roy E. Wootton, Murrysville, and Roy E. Voshall, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

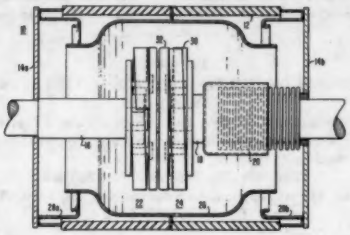
Filed Jun. 29, 1981, Ser. No. 278,517

Int. Cl.³ H01H 33/66

U.S. Cl. 200—144 B 5 Claims

1. An improved vacuum circuit interrupter comprising a hermetically sealed, highly evacuated envelope with conductive leads sealed through the envelope, arc contacts disposed

within the envelope at internal ends of the conductive leads, with at least one of the arc contacts being movable into closed circuit mating contact with the other arc contact and to open circuit spaced apart relationship, and including means for generating an axial magnetic field between the spaced apart arc contacts directed parallel to the longitudinal axis of the enve-



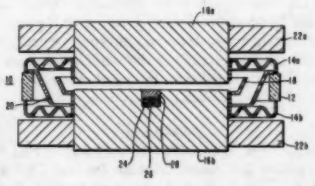
lope and the arc path between the contacts, the improvement wherein at least one of the arc contacts comprise means for spacially modulating the applied axial magnetic field over the area of the contact to produce adjacent regions of differing magnetic field strength whereby a plurality of spaced apart low arc voltage and stable parallel arc current path areas are provided over the contact area.

4,401,869

HERMETICALLY SEALED ELECTRICAL SWITCH WITH PRESSURE REGULATING GETTER MEANS

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1981, Ser. No. 308,208
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **4 Claims**



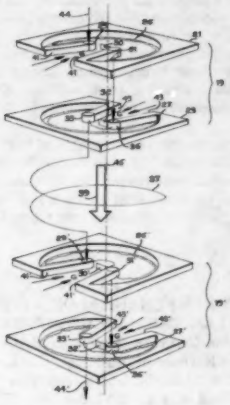
1. In an electrical switch module which is hermetically sealed and comprises an annular insulating envelope portion, annular flexible corrugated diaphragm members extending transversely inwardly from the annular insulating envelope portion to cylindrical conductive contact members, with a reduced pressure non-oxidizing fill gas atmosphere of from about 10^{-1} to 10^{2} Torr provided within the hermetically sealed switch module, the improvement wherein the fill gas is hydrogen and a predetermined amount of selected hydrogen gettering metal hydride is disposed within the hermetically sealed switch module, which metal hydride is selected with a hydrogen equilibrium pressure characteristic at the switch operating temperature such that the hydrogen fill gas pressure is maintained in the desired pressure range.

4,401,870

MODULAR SUCTION-GAS-COOLED MAGNETIC BLAST CIRCUIT BREAKER

Guy St-Jean, Longueuil, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Nov. 10, 1981, Ser. No. 320,140
Int. Cl.³ H01H *33/18*
U.S. Cl. 200—147 R **12 Claims**



1. A gas-cooled magnetic blast circuit breaker for mounting on an electric power line, said breaker including at least one module comprising:

(a) a generally flat body made of electrically non-conductive air-permeable material and formed with an upper and a lower arc breaking chamber, said chambers being separated from one another by a central wall of said body;

(b) a pair of electrically conductive stationary contact members, each mounted in one of said chambers, said members extending through said body and to opposite faces of said body;

(c) an electrically conductive dual contact member pivotally mounted across said central wall and having a contact gate at each end thereof, each contact gate being located in one of said chambers for cooperating with the stationary contact member therein;

(d) a pivotable shaft, made of electrically non-conductive material, extending transversely through said body and connected to said dual contact member to cause pivotal motion thereof whereby to move said contact gates simultaneously into and out of electrical junction with said stationary contact members thereby to make and break current in said power line;

(e) a coil energizable by the current in said power line and adapted to create a magnetic field suitable to blow, into said arc breaking chambers, arcs that are formed when said contact gates are moved away from said stationary contact members, and

(f) means in said chambers defining guideways extending from outside said body to said contact members to lead gas, sucked in by said blown arcs, to said contact members for cooling thereof.

4,401,871
HALOGENATED HYDROCARBON COMPOSITIONS AND ELECTRICAL APPARATUS CONTAINING SUCH COMPOSITIONS

Harold Lloyd, Christchurch, and John Coxon, Halton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 15, 1982, Ser. No. 339,308
Claims priority, application United Kingdom, Jan. 14, 1981, 8101014
Int. Cl.³ H01H *33/68;* H01B *3/24*
U.S. Cl. 200—150 A **13 Claims**

1. A liquid halogenated hydrocarbon composition suitable for use as a dielectric and/or arc-extinguishing fluid in electrical apparatus, which comprises

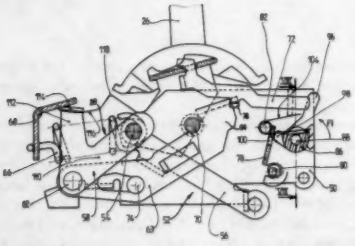
(a) a major proportion by weight of one or more halogenated paraffinic hydrocarbons having at least 8 carbon atoms and containing from 40% to 70% by weight of halogen based on the halogenated paraffinic hydrocarbon, and

(b) a minor proportion by weight of at least one non-flammable viscosity-reducing additive for the halogenated paraffinic hydrocarbon (a) which contains at least 50% by weight of halogen based on the additive and is a halogenated aliphatic hydrocarbon containing from 2 to 6 carbon atoms.

4,401,872
OPERATING MECHANISM OF A LOW VOLTAGE ELECTRIC CIRCUIT BREAKER

Bernard Boichot-Castagne, Sassenage; Roger Case, Seyssinet-Pariset, and Reynald Marin-Pache, Claix, all of France, assignors to Merlin Gerin, Grenoble, France

Filed May 11, 1982, Ser. No. 377,030
Claims priority, application France, May 18, 1981, 81 10000
Int. Cl.³ H01H *3/54*
U.S. Cl. 200—153 G **5 Claims**



1. A multi-pole circuit breaker having an insulating housing, a plurality of poles positioned in said housing, an operating mechanism supported in said housing, a plurality of movable contacts operated by said operating mechanism, said operating mechanism comprising:

a toggle joint with a lower link and an upper link connected by a knee pivot pin;

a trip hook pivotally mounted on a fixed pivot, said upper link being operatively connected to said trip hook;

a handle supporting rocker pivotable between closed and open positions to open and close said contacts;

a bar of insulating material, connected mechanically to the lower link of the toggle joint, to drive the movable contacts of the poles between closed and open positions;

a spring having a first end anchored to the rocker and a second end anchored to said knee pivot pin of the toggle joint;

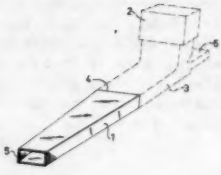
a releasable latch to engage the trip hook in a latched position, said upper link having an extension forming a drive lever with a drive lug cooperating with said rocker, said drive lug rotating to move said trip hook to said latched position when said rocker is moved by the handle towards the open position, said rocker being operable between open and closed positions to operate said spring, when said latch and trip hook are in said latched position, to alternately collapse and allow expansion of said toggle joint to respectively open and close said contacts; and

a trip device automatically operable upon the occurrence of overload current conditions above a predetermined value to effect release of said latch whereupon said spring operates to move said movable contacts to the open position.

4,401,873
MICROWAVE HEATING DEVICE WITH TAPERED WAVEGUIDE

Benny Berggren, Vällingby, and Göran Böling, Täby, both of Sweden, assignors to Stiftelsen Institutet For Mikrovagsteknik, Stockholm, Sweden

Filed Nov. 18, 1980, Ser. No. 208,004
Claims priority, application Sweden, Nov. 28, 1979, 7909825
Int. Cl.³ H05B *6/70*
U.S. Cl. 219—10.55 A **3 Claims**



1. A device for microwave heating, comprising: a wave guide in which a material is intended to be heated, and a microwave source (2) connected to the wave guide, wherein the waveguide at least includes one part (1) the cross sectional area of which continuously decreases from the larger end (4) of said part located closest to the microwave source (2) to the smaller other end (5) of said part so that no reflection to the feed-in end occurs, and where the wave guide configuration along said part includes a portion between its two ends having a resultant geometry at which fed-in microwave energy no longer can propagate in said portion of said wave guide part (1), said tapered wave guide part (1) slowly and continuously decreases in cross-section to so-called propagation cut-off at said portion within said part which is at a certain distance from the smaller other end (5) of said part, and continues to slowly decrease in cross-section beyond the cut off position to the smaller other end, which distance is such that no microwave energy will leak out from the smaller end (5) of the wave guide part (1) when the wave guide is loaded with intended material to be heated.

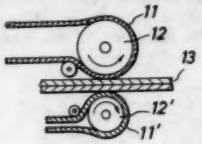
4,401,874
METHOD OF WELDING TIN-FREE STEEL CAN

Yoichi Kitamura, Yokohama; Makoto Ito, and Chikara Yurita, both of Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,816
Claims priority, application Japan, Mar. 8, 1980, 55-28586
Int. Cl.³ B23K *11/32*
U.S. Cl. 219—64 **5 Claims**

1. In a process for the preparation of welded cans, which comprises forming a can blank into a cylinder and passing a lap portion of the formed cylinder between a pair of electrode rollers through an electrode wire to effect electric resistance welding, the improvement wherein said can blank is a tin-free steel blank comprising a steel plate substrate, a layer of metallic chromium in the amount of 20 to 100 mg/m^2 formed on the surface of the steel plate substrate and a layer of chromium oxide in an amount of 1 to 10 mg/m^2, calculated as metallic chromium, formed on the metallic chromium layer; electric

resistance welding is carried out in an inert atmosphere in the state where an electrode wire having a plated layer of a soft metal selected from the group consisting of tin and alloys thereof, the thickness of said plating layer being 0.1 to 20 μm,



is kept in close contact with the chromium oxide layer of the tin-free steel blank; and after completion of welding, the lap portion is kept in an inert atmosphere until the surface of the lap portion is reduced below 550° C.

4,401,875

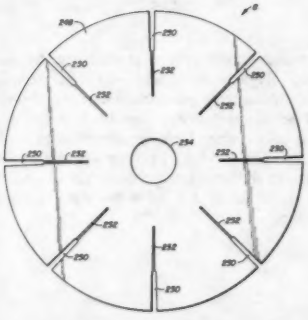
SAW BLADE FOR HIGH SPEED ELECTRIC ARC SAW

Max P. Schlienger, Ukiah, and Whalun Szeto, Novato, both of Calif., assignors to Retech, Inc., Ukiah, Calif.

Continuation-in-part of Ser. No. 793,991, May 5, 1977. This application Jun. 22, 1981, Ser. No. 276,212

Int. Cl.³ B23P 1/12

U.S. Cl. 219—69 V **10 Claims**



6. In a highspeed arc saw for cutting a kerf into a metallic object including an electrically conductive saw blade, means for rotating the saw blade about its axis, a power source operatively coupled with the blade in the object including means for flowing a current between them having a current density in the range of no less than between about 2 to 16×10^6 amps per meter^2, feeding means for advancing the saw blade toward and past the object while the current flows between them, means for monitoring the current flow between the blade and the object and control means operatively connected with the monitoring means and the feeding means for varying the blade advancing speed as a function of the monitored current flow so as to maintain the current flow substantially constant while the kerf is being cut, an improved saw blade having a plurality of radially inwardly extending gullets formed therein where at least some of said gullets terminate in a narrow slit extending further toward the center of the blade, said gullets defining openings on the periphery of the blade which are sufficiently small relative to the distance between adjacent openings so that current flow between the blade and the object is not interrupted as the blade is rotated.

4,401,876

WORKING GEMSTONES

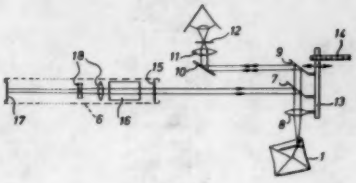
Martin Cooper, 38, Marsden Green, Welwyn Garden City, Hertfordshire, England

Filed May 18, 1981, Ser. No. 264,710

Claims priority, application United Kingdom, May 20, 1980, 8016669; Aug. 7, 1980, 8025737

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LJ **7 Claims**



1. A method of cleaving a gemstone, comprising:

mounting said gemstone in position, said gemstone having a surface to be kerfed;

generating a high energy, low order mode, laser beam;

focussing said beam substantially on said surface, thereby removing gemstone material from said surface;

moving said beam relative to said surface, thereby cutting a kerf; and

inserting the tip of a tool in said kerf and thereby cleaving the gemstone.

4,401,877

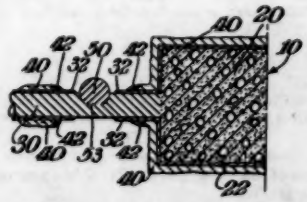
METHOD FOR SOLID TANTALUM CAPACITOR WITH CLEAN RISER

Dean A. Webber, Waterboro, and Peter S. Besse, Sanford, both of Me., assignors to Sprague Electric Company, North Adams, Mass.

Division of Ser. No. 143,692, Apr. 25, 1980, Pat. No. 4,344,107. This application Jan. 8, 1982, Ser. No. 337,921

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LJ **9 Claims**

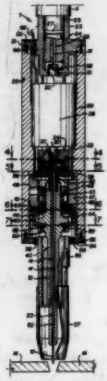


1. A method of making a solid tantalum capacitor having a tantalum anode with a riser extending therefrom, an external lead welded to said riser, a dielectric on said anode and said riser, and a manganese dioxide solid electrolyte on said dielectric, wherein the improvement comprises clearing an area around the weld site of said riser to said external lead free of said dielectric and said solid electrolyte by directing a laser beam on said area so as to volitalize said dielectric and said solid electrolyte at said site and to convert said solid electrolyte on the fringe of said site to a low conductivity manganese oxide.

4,401,878
CONSUMABLE ARC WELDING TORCH

Richard A. Roen, Denver, Colo., assignor to RSR Systems, Inc., Englewood, Colo.

Filed Mar. 30, 1981, Ser. No. 248,844
Int. Cl.³ B23K 9/00
U.S. Cl. 219—137.31 7 Claims



1. In a torch for continuous arc welding which includes a body through which an electrode wire moves, into the head end of the body and from the base end thereof, and means to produce a wire consuming electric arc as the wire moves from the base end of the body, the improvement comprising:

(a) an elongated wand within the body having a head end within the body and a base end at the base end of the body, an axial passageway from the head end to the base end through which the electrode wire moves, and a tip at the base end with the arcing end of the wire being extended therefrom; and

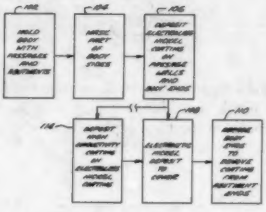
(b) a rotation means adapted to move the wand and the arcing end of the wire in a circular path and including a motor within the body adjacent to the head end of the body and having a tubular shaft in substantial alignment with the wand, with the electrode wire being extended through the motor shaft and into the wand passageway, a rotor head having an eccentric mount means is mounted on the motor shaft and the head end of the wand is carried in the eccentric mount means to move in a circular path as the motor shaft rotates the rotor head, and the diameters of the passageways through the motor shaft and wand, with respect to the eccentricity of the mount means, are sufficient to permit movement of the electrode wire from the motor shaft and into the wand.

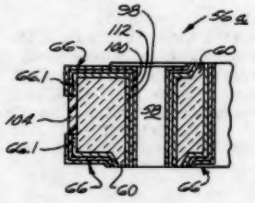
4,401,879
SELF-REGULATING ELECTRICAL RESISTANCE HEATER AND FUEL SUPPLY SYSTEM USING THE HEATER

Vishwa N. Shukla, Attleboro, and Bernard M. Kulwicki, Foxboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 20, 1981, Ser. No. 236,389
Int. Cl.³ B60L 1/02
U.S. Cl. 219—206 10 Claims

7. An automotive fuel supply system comprising fuel supply means for furnishing a mixture of air and an alcohol-based fuel to an internal combustion engine, and self-regulating electrical resistance heater means operable for heating at least one constituent of the air-fuel mixture for enhancing evaporation of the fuel being furnished to the engine, said heater means having a body of ceramic material of positive temperature coefficient of resistivity adapted to display a sharp increase in resistivity when heated above a predetermined transition temperature for limiting self-heating thereof and having contact means bonded to the ceramic material for applying electrical power to the body to generate heat, characterized in that, the contact means comprise an inner coating of electroless deposited nickel which is bonded in ohmic contact relation to the ceramic material so that the inner coating permits electrical power to be efficiently applied to the ceramic body for achieving desired heat-up characteristics in the heater and so that the inner coating retains its ohmic contacting properties on the ceramic material





during extended thermal cycling of the heater for maintaining said heat-up characteristics, and additional coating means including a substantially pore-free outer, corrosion-resistant coating of an electrolytically deposited nickel covers and protects the inner coating from reaction with an alcohol atmosphere surrounding the heater during thermal cycling of the heater, whereby the inner coating continues to retain its ohmic contacting properties so that the heater maintains said heat-up characteristics.

4,401,880
DEVICE TO MELT ICE AND SNOW ON A ROOF STRUCTURE

Claude E. Eizenhoefer, 3421 Kent St., St. Paul, Minn. 55112

Filed Nov. 19, 1981, Ser. No. 322,845
Int. Cl.³ H05B 1/00
U.S. Cl. 219—213 10 Claims

1. A roof surface ice and snow melting device comprising

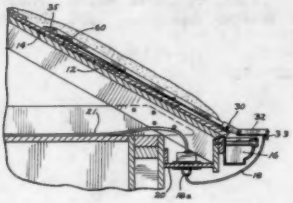
an elongated channel member of heat conductive material forming a housing,

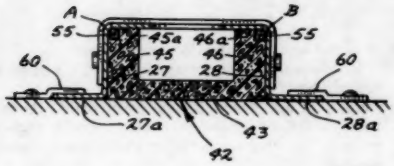
said channel member having a top wall, side walls and an open bottom,

a heating cable disposed within said channel member,

insulting means securing said cable in contrast with said wall,

supporting means for said channel member,





means hingedly securing to said channel member an end portion thereof, and

said end portion extending over a gutter pipe.

4,401,881

TWO-DIMENSIONAL THERMAL HEAD

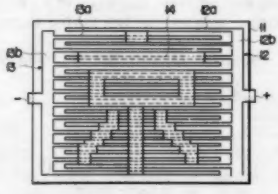
Tamio Saito, Oume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 17, 1981, Ser. No. 244,796

Claims priority, application Japan, Mar. 21, 1980, 55-34760; Mar. 26, 1980, 55-38647; Jul. 18, 1980, 55-98561

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—216 **13 Claims**



1. A thermal head for thermally printing a two-dimensional pattern comprising:

an insulating substrate;

first electrode means including a plurality of first electrodes which are fixed on said insulating substrate and extend parallel with each other, one end of each of said first electrodes being commonly and electrically connected to be supplied with a first voltage.

second electrode means including a plurality of second electrodes which are fixed on said insulating substrate and extend parallel with each other in interdigitated relation to said first electrodes, one end of each of said second electrodes being commonly and electrically connected to be supplied with a second voltage lower than said first voltage; and

at least one two-dimensional resistive pattern defining a configuration to be directly and thermally printed on a thermosensitive recording medium, and which is fixed on plural pairs of said first and second electrodes for being heated by the voltage difference between said first and second voltages.

4,401,882

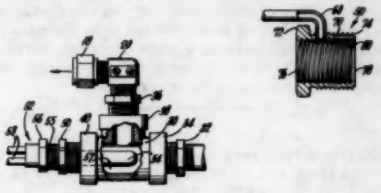
PLUMBING FITTING

Bayard G. Gardineer, Skillman, and James A. Heringes, Dayton, both of N.J., assignors to Technicare Corporation, Solon, Ohio

Filed Aug. 26, 1981, Ser. No. 296,091

Int. Cl.³ F24H *9/12*; H05B *3/06*

U.S. Cl. 219—335 **2 Claims**



1. A fitting for connecting an immersion heater into a fluid system comprising:

a generally annular stem portion having a free end and having a second end;

a cap portion affixed to said second end and adapted to be engaged by a plumbing tool;

threads on the inside of said stem portion for connecting said fitting to said heater element by means of cooperating threads on said heater element;

threads on the outside of said stem portion for connecting said fitting into said fluid system;

an axial groove extending transverse to the threads on the inside surface of said stem portion, said groove extending from said free end of said fitting a predetermined distance along said threads;

said stem having an opening through its wall in fluid communication with said groove;

said groove and said opening permitting a flow of a small quantity of fluid through said fitting to facilitate the removal of undesired bubbles that may be present around the base of said heating element.

4,401,883

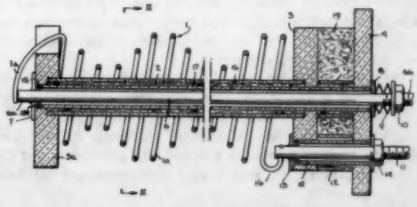
ELECTRIC RESISTANCE HEATER

Robert A. Watson, Woodbury, Conn., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Aug. 14, 1981, Ser. No. 292,444

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—381 **4 Claims**



1. An electric resistance heater having an exposed resistance coil adapted to be positioned transversely to a high velocity blast of air for convection heating of the air to metal heating-treating temperatures and comprising an elongated coil of

resistance wire, a first rigid non-conductive refractory tube extending through the coil so as to support the coil from sagging when horizontally positioned, terminals positioned at only one end of the tube for the opposite ends of the coil, and a conductor extending through the tube, one of the coil's ends connecting directly with one of the terminals at said one end of the tube and the other of the coil's ends connecting at the other end of the tube with the conductor and the conductor connecting with another of the terminals at said one end of the tube, the first tube containing a second rigid non- conductive refractory tube encircling the conductor, both tubes being subject to cracking when thermally stressed and a short-circuit between the coil and conductor being possible only if both tubes crack at the same place, said coil being a porcupine coil comprising a substantially helical series of substantially flat convolutions having straight legs and looped ends, the legs contacting said first tube tangetially so as to form hot spots therein when the coil is heated, said tubes being made of ceramic materials and said heater having means for structurally uniting said tubes and conductor via their respective end portions.

4,401,884

METHOD OF CONTROLLING HEATING IN FOOD HEATING APPARATUS INCLUDING INFRARED DETECTING SYSTEM

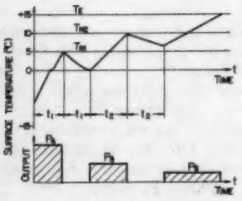
Shigeru Kusunoki, Yamatokoriyama; Keijiro Mori, and Takato Kanazawa, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 77,091, Sep. 20, 1979, abandoned. This application Feb. 3, 1982, Ser. No. 345,377

Claims priority, application Japan, Sep. 26, 1978, 53-118830; Sep. 26, 1978, 53-118831; Sep. 26, 1978, 53-118832

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—492 **10 Claims**



1. A method of controlling the application of heat to food in a food heating apparatus including a source of heat, infrared detecting means for generating at least one signal related to the surface temperature of said food, and control means for turning on and off said source of heat in accordance with at least one of a plurality of preset input parameters including predetermined on and off heating intervals, the number of times said source of heat is turned on and off and predetermined temperatures not greater than a predetermined target temperature to which said food is heated, said method comprising the steps of:

(a) measuring the surface temperature of said food by means of said infrared detector;

(b) generating a constant heat output from said heat source to continuously heat said food until the surface thereof reaches said predetermined target temperature;

(c) turning said heat source off by means of said control means after said food reaches said predetermined target temperature for said preset predetermined off heating interval;

(d) generating said constant heat output from said heat source until the surface of said food again reaches said predetermined target temperature; and

(e) repeating steps (c) and (d) until said heat source has been turned on and off said preset number of times.

4,401,885

PLANAR HEAT GENERATING DEVICE

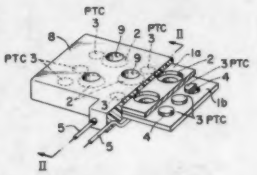
Eiichi Ishii, Ebina; Yoshiaki Mori, Atsugi, and Minoru Toyoda, Takatsuki, all of Japan, assignors to Nippon Valqua Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 309,024

Claims priority, application Japan, Oct. 8, 1980, 55-142827[U]

Int. Cl.³ H05B *3/06*

U.S. Cl. 219—523 **7 Claims**



1. A planar heat generating device comprising:

two heat radiating plates of metal in which a plurality of through-holes are formed;

a plurality of heat generating units which are held by said two heat radiating plates, said heat generating units being made of positive temperature characteristic resistance material;

two lead wires connected to said two heat radiating plates, respectively; and

an insulating cover layer of heat resisting synthetic resin enclosing said two heat radiating plates, said heat generating units and the portions of said lead wires which are connected to said heat radiating plates,

fluid through-holes being formed in the parts of said insulating cover layer which are over said through-holes cut in said heat radiating plates, said fluid through-holes being smaller in diameter than said through-holes cut in said heat radiating plates.

4,401,886

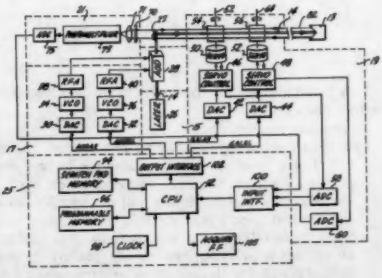
ELECTROMAGNETIC BEAM ACQUISITION AND TRACKING SYSTEM

C. Ray Pond, Federal Way, and Reynold E. Wilbert, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 23, 1981, Ser. No. 246,439

Int. Cl.³ G01C *1/00*

U.S. Cl. 250—203 R **30 Claims**



1. An electromagnetic beam acquisition and tracking system for acquiring and tracking a target supporting a reflection device for redirecting an electromagnetic beam back along its incident axis, said electromagnetic beam acquisition and tracking system comprising:

(A) a source of electromagnetic radiation for producing a coherent electromagnetic beam of energy;

(B) a mechanical deflection system for intersecting and deflecting said electromagnetic beam produced by said source of electromagnetic radiation;

(C) an acousto-optic deflection system for intersecting and deflecting said electromagnetic beam produced by said source of electromagnetic radiation, said mechanical deflection system and said acousto-optic deflection system being positioned so as to serially deflect said electromagnetic beam;

(D) a return beam detection system for detecting a returning electromagnetic beam redirected back along its incident axis by a reflection device mounted on a target when said electromagnetic beam impinges on said reflection device; and,

(E) a controller coupled to said mechanical deflection system, said acousto-optic deflection system and said return beam detection system for:

(1) receiving a signal from said return beam detection system when a returning electromagnetic beam is detected by said return beam detection system; and,

(2) controlling said mechanical deflection system and said acousto-optic deflection system such that: (a) said electromagnetic beam is swept in a predetermined search pattern until a target is acquired by said return beam detection system detecting a returning electromagnetic beam; and, (b) thereafter, said beam is directed towards said target as determined by said return beam detection system detecting a returning electromagnetic beam.

4,401,887

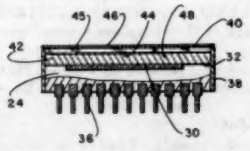
REDUCING FLARE IN SELF-SCANNED PHOTOSENSOR ARRAYS

Jack D. Finley, Acton, and Robert E. Whitney, Burlington, both of Mass., assignors to Eikonix Corporation, Bedford, Mass.

Filed Oct. 1, 1980, Ser. No. 192,719

Int. Cl.³ H01J *5/16*

U.S. Cl. 250—216 **10 Claims**



1. Apparatus comprising:

a housing having a cover of transparent material with a predetermined index of refraction;

an array of photosensors deposited in a space within said housing beneath said cover; and

index matching means having an index of refraction substantially the same as that of said index of refraction of said cover,

said index matching means being deposited in said space between said cover and said array of photosensors for reducing internal reflections in said housing.

4,401,888

AUTOMATIC SENSING DEVICE FOR OFF-HORIZONTAL AND OFF-VERTICAL DETECTION

Richard D. West, Federal Way, and Donald O. West, Lacey, both of Wash., assignors to Quentron, Inc., Bellevue, Wash.

PCT No. PCT/US81/01281, § 371 Date Sep. 23, 1981, § 102(e) Date Sep. 23, 1981, PCT Pub. No. WO83/01137, PCT Pub. Date Mar. 31, 1983

Continuation-in-part of Ser. No. 165,620, Jul. 3, 1980, abandoned. This PCT application Sep. 23, 1981, Ser. No. 318,013

Int. Cl.³ G05D *1/08*; B63B *1/22*

U.S. Cl. 250—231 R **12 Claims**

9. A sensing and switching device for responding to the off-horizontal and/or off-vertical condition of a device and for generating correction signals for controls and correction means attached to said device, comprising:

(a) an upstanding housing having side and bottom walls,

(b) a generally horizontally disposed support plate within said housing and spaced below said upper end and above said bottom, said support plate including balance shaft retaining means generally centrally disposed on said support plate,

(c) a balance shaft assembly including a substantially vertically disposed balance shaft having an upper end and a lower end which is supported on said retaining means, said balance shaft assembly including balancing weight means attached thereto for holding said balance shaft in said retaining means and including light emitting means and light responsive means at its upper end,

(d) target plate means supported independently of said light emitting and light responsive means such that movement of said housing will move said target plate with respect to said lightemitting and light responsive means to generate a correction signal.

4,401,889

METHOD AND APPARATUS FOR MEASURING THE INTENSITY OF PREFERABLY GAMMA RADIATION OF RADIATION ACTIVE DEPOSIT CONTAINED WITHIN A LIQUID SAMPLE

Ole Buus, Birkerod, and Michael J. Nielsen, Frederiksberg, both of Denmark, assignors to Medi-Lab, Medicinsk Laboratorium A/S, Denmark

Continuation of Ser. No. 54,174, Jul. 2, 1979. This application Mar. 30, 1981, Ser. No. 249,119

Claims priority, application Denmark, Jul. 12, 1978, 3139/78

Int. Cl.³ G01T *1/00*; G01N *21/00*

U.S. Cl. 250—328 **8 Claims**

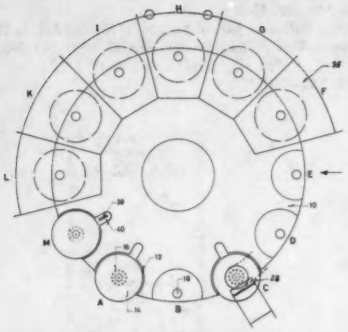
1. Apparatus for measuring the intensity of gamma radiation or other type of radioactive radiation from a radiation active deposit contained within a liquid sample, comprising:

means for isolating said deposit by filtering said liquid sample,

means comprising a plurality of radiation detectors each one of which successively performs a partial measurement on

said deposit, said isolating means and said radiation detectors being arranged so as to form a process line,

means for intermittently and successively advancing a plurality of said deposits step by step along the process line from said isolating means past each radiation detector in



turn, each of said partial measurements being performed in the same time interval as subsequent deposits are being isolated by filtering said liquid sample,

means for summing up the measuring results from the individual partial measurements on a deposit, and

means for registering said sum.

4,401,890

PHOTON EMISSION TOMOGRAPHIC APPARATUS

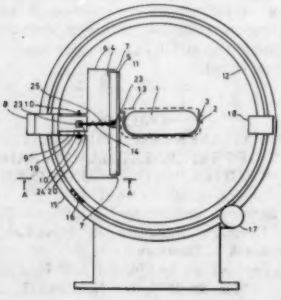
Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 163,057, Jun. 26, 1980. This application Nov. 5, 1980, Ser. No. 204,304

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S **14 Claims**



1. A body rotational imaging system for radiation detector means, comprising: body support means; body support rotation means; and body contour following means, said body contour following means causing the surface of said body to be adjacent to a face of said detector means to maintain a minimum distance between said detector means and said body as said body is rotated before said detector means for improved image resolution.

4,401,891

ELECTRET DEVICES FOR MEASURING IONIZING RADIATION

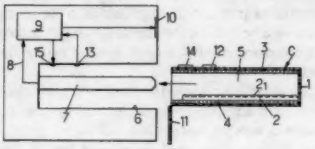
Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint-Cloud; Gérard Dreyfus, Rue du Viaduc, Villebon s/Yvette, 91120 Palaiseau, and Didier Perino, 10, rue de Bellevue, 92150 Suresnes, all of France

Filed Jan. 21, 1981, Ser. No. 226,760

Claims priority, application France, Feb. 11, 1980, 80 02969

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—374 **10 Claims**



1. Measuring device for ionizing radiation comprising, at least one cassette containing an electret disposed between two electrodes which are separated from one another so as to provide between the electret and one electrode an ionizing chamber sensitive to the radiation to be measured and at least one "entry" reader comprising a pocket for receiving the cassette in a predetermined position therein, a source of electrical current, means for identifying the cassette, means for reading and measuring the charge of the electret contained in the cassette and means for displaying data related to the result of said measurement, said device comprising in addition at least one auxiliary reader, each cassette comprising means for automatically receiving the recording of data relating to the charge of the electret thereof when the cassette is initially inserted into the entry reader and to present the recorded data so that this data can be read automatically upon the insertion of the cassette into an auxiliary reader, each entry reader comprising, in addition to means for measuring the momentary charge of the electret contained in each cassette which is introduced therein, means for processing the said data and for recording said data on said inserted cassette, and each auxiliary reader comprising, in addition to means for measuring the momentary charge of the electret contained in each cassette which is inserted therein, means for reading the data previously recorded on this cassette and means for calculating and displaying data connected with the difference between two successively measured charges of the electret.

4,401,892

LABEL READER AND SYSTEM

C. Martin Peters, 1037 Nottingham, Grosse Pointe Park, Mich. 48230

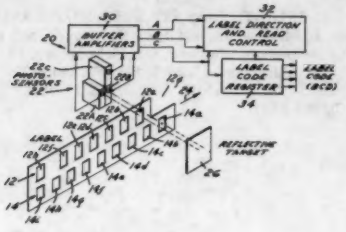
Continuation of Ser. No. 272,746, Jun. 11, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 473,979

Int. Cl.³ G06K *7/10*

U.S. Cl. 250—566 **12 Claims**

1. Apparatus for reading a label or the like carrying a code readable in the form of binary indicia comprising means for defining a path to receive a label in an orientation such that said indicia are disposed in at least one track extending in the direction of label travel in said path, first and second sensor means disposed in spaced positions adjacent to said path respectively corresponding to positions of said tracks on a label traveling in said path, first means for receiving input data signals from said first sensor means as a function of indicia in a first portion of said tracks passing adjacent to said first sensor means, second means responsive to indicia in a second portion of said tracks for loading data signals from said first sensor means into said first means, third means responsive to said first and second sensor means for loading data control signals into said first

means as a function of the direction and orientation of travel of a label traveling in said path adjacent to said sensor means, and fourth means responsive to said data control signals for outputting said data signals in a predetermined order of significance independently of the direction and orientation of travel of the label past said sensor means.

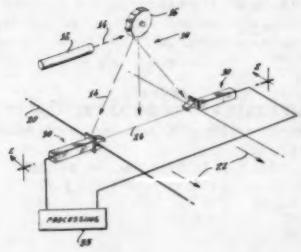


4,401,893

METHOD AND APPARATUS FOR OPTICALLY INSPECTING A MOVING WEB OF GLASS

Andre Dehuysser, Brussels, Belgium, assignor to Intec Corporation, Trumbull, Conn.

Filed Jul. 29, 1981, Ser. No. 288,010
Int. Cl.³ G01N 21/32
U.S. Cl. 250—572 **8 Claims**



4. An automatic optical inspection system for inspecting a moving web of glass comprising:

a light source,

scanning means for scanning said light source orthogonally across said moving glass web,

said light source being internally reflected within said glass web toward the edges thereof when said light source strikes a defect therein,

collecting means positioned on opposite edges of said glass web for capturing the light emerging from the edges of said glass web,

detector means having said collecting means coupled thereto for applying the radiation gathered by said collecting means to said detector means,

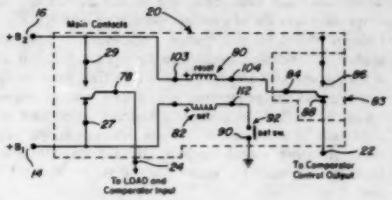
said detector means generating electrical signals in accordance with the intensity of the light applied thereto which may be used for determining defects in the glass web.

4,401,894

AUTOMATIC UNINTERRUPTED D.C. POWER SOURCE SWITCH

Daniel M. Weisner, Mount Airy, Md., assignor to Professional Products, Inc., Bethesda, Md.

Filed Dec. 24, 1980, Ser. No. 220,257
Int. Cl.³ H02J 7/00
U.S. Cl. 307—64 **5 Claims**



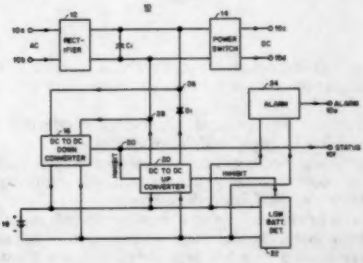
1. In combination with at least two independent power sources, a common load, switching means for alternately connecting said load directly to said sources, and voltage level sensing means connected to the switching means for automatically effecting switchover of the load from one of the sources to the other during a switchover interval in response to depletion of energy in said one of the sources, the improvement residing in said level sensing means including voltage comparator means connected to the load for developing a switching signal in response to a drop in load voltage below a predetermined threshold, relay means connected to the switching means and said two sources for maintaining the two sources isolated from each other during said switchover interval and means responsive to said switching signal for maintaining supply of energy to the load from said one of the sources in by-pass relation to the relay means only during said switchover interval preventing any drop in load voltage below the threshold during said switchover interval.

4,401,895

SUPPLY FOR PROVIDING UNINTERRUPTIBLE D-C POWER TO A LOAD

Dennis W. Petkovsek, Lorain, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Sep. 20, 1982, Ser. No. 420,598
Int. Cl.³ H02J 7/00
U.S. Cl. 307—66 **14 Claims**



6. A circuit adapted for use with a power supply to thereby form in combination therewith a system to provide uninterruptible d-c power to a load said supply being of the type which includes rectifying means responsive to an a-c signal for generating a d-c signal whose relatively large amplitude varies as a function of the amplitude of the a-c signal at the output of said rectifying means and power switching means whose input is directly connected to said rectifying means output to thereby

generate from said rectifying means output signal a d-c signal for supplying power to said load when said system operates in a normal mode, said circuit comprising:

(a) source means for providing a relatively low amplitude d-c voltage;

(b) up converter means having an output and responsive to said source means voltage for generating at said output a d-c voltage of relatively high amplitude said amplitude being less than said rectifying means output d-c signal amplitude when said system operates in its normal mode;

(c) alarm and detection means responsive to said source means d-c voltage amplitude for generating an alarm signal when said amplitude falls to a first predetermined voltage and for generating a signal to said up converter means to inhibit the operation thereof when said amplitude falls to a second and lower predetermined voltage said inhibiting signal turning off said up converter to thereby terminate the supply of d-c power to said load; and

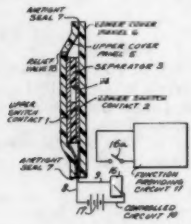
(d) coupling means for connecting said up converter means output to said rectifying means output said coupling means being nonconductive when said system operates in said normal mode and becoming conductive when said rectifying means output signal amplitude falls below said up converter means output voltage amplitude whereby said system uses said battery to supply d-c power to said load.

4,401,896

WEIGHT OR AMBIENT PRESSURE-RESPONSIVE MECHANICAL PRESSURE SWITCH

Eugene W. Fowler, 816 Superba Ave., Venice, Calif. 90291, and Raymond W. Fowler, 2465 Amherst Ave., Los Angeles, Calif. 90064

Filed May 26, 1981, Ser. No. 266,714
Int. Cl.³ H01H *21/26, 35/34*
U.S. Cl. 307—118 **17 Claims**



1. A pressure switch for performing a function when subjected to a difference in pressure, said pressure switch comprising

a pair of superimposed electrically conductive switch contacts having a modulus of elasticity;

electrically non-conductive separating means interposed between the pair of switch contacts, said separating means having a hole formed therethrough;

a cover of electrically non-conductive flexible material covering said switch contacts whereby said switch contacts are pressed together into electrical contact with each other, through said hole, by pressure exerted on said cover and are moved into spaced relation with each other by a decrease in pressure on said cover, said cover forming a substantially airtight enclosure;

a relief valve in said cover for equalizing the pressure of air therein with the ambient air pressure; and

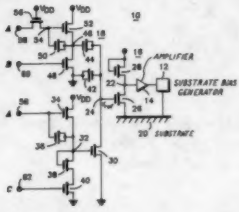
electrically conductive leads electrically connected to, and extending from, said switch contacts, whereby the positions of said switch contacts relative to each other are determined by differences in pressure and control the operation of an electrical circuit electrically connected to said leads to operate a circuit to perform a function.

4,401,897

SUBSTRATE BIAS VOLTAGE REGULATOR

William L. Martino, Jr., and Jerry D. Moench, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 17, 1981, Ser. No. 244,832
Int. Cl.³ H03L *5/00;* H03K *17/693*
U.S. Cl. 307—297 **8 Claims**



1. In a substrate bias voltage regulator comprising:

substrate bias voltage generator means for generating a substrate bias voltage related to a control voltage; and

substrate bias voltage control means coupled to the substrate bias voltage generator means and to the substrate, for comparing the bias voltage generated on the substrate to a reference voltage, and for providing a control voltage for application to the substrate bias voltage generator in proportion to the difference between said reference voltage and said sensed bias voltage;

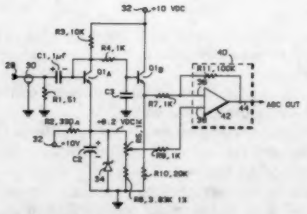
reference voltage generator means coupled to the substrate bias voltage control means and to a reference control terminal, for receiving a reference control signal via the reference control terminal, for providing the reference voltage at a first predetermined level in response to the received reference control signal having a first state, and for providing the reference voltage at a second predetermined level in response to that received reference control signal having a second state.

4,401,898

TEMPERATURE COMPENSATED CIRCUIT

Raymond Sommerer, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Sep. 15, 1980, Ser. No. 187,310
Int. Cl.³ H03K *1/04;* G01J *5/00*
U.S. Cl. 307—310 **8 Claims**



1. A temperature stabilized circuit comprising:

(a) circuit means for accepting an input signal;

(b) means for establishing a reference voltage comprising a zener diode;

(c) a first means for controlling a first current, said first means comprising a first semiconductor, said first semiconductor comprising a plurality of electrodes, said plu-

rality of electrodes being connected in diode configuration, said first means being provided with a reference voltage by said means for establishing a reference voltage, said reference voltage determining a base level of current through said first semiconductor, and said first semiconductor being responsive to a signal from said circuit means;

(d) a coupling circuit responsive to a signal from said first semiconductor;

(e) second means for controlling a second current to be substantially equal to said first current, said means for controlling second current comprising a second semiconductor, said second semiconductor comprising a plurality of electrodes connected in emitter follower configuration, said second semiconductor having at least one temperature characteristic matched to at least one temperature characteristic of said first semiconductor, and said second semiconductor being coupled to said first semiconductor by said coupling circuit;

(f) an output circuit responsive to a signal from said second semiconductor; and

(g) means for applying power to the temperature stabilized circuit.

4,401,899

CURRENT COMPARATOR CIRCUIT

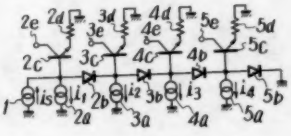
Takashi Okada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 966,661, Dec. 5, 1978, abandoned. This application Dec. 5, 1980, Ser. No. 213,366

Claims priority, application Japan, Dec. 28, 1977, 52-160608

Int. Cl.³ H03K *5/153, 13/175*

U.S. Cl. 307—350 **5 Claims**



1. A current comparator circuit comprising an input signal current source, a first reference current source with one side connected to a reference potential and its second side connected to said input current source, a first diode with its first side connected to the second side of said first reference current source, a second reference current source with a first side connected to a reference potential, a second diode with a first side connected to the second sides of said first diode and the second side of said second reference current source, the second side of said second diode coupled to reference potential, a first comparator output circuit including a first switching transistor with a control electrode, a second electrode and a third electrode with the control electrode connected to said input signal current source and to the first side of said first diode, an output terminal connected to said second electrode, said third electrode coupled to reference potential, a second transistor with a control electrode, a second electrode and a third electrode with said control electrode connected to the first side of said second diode, a second output terminal connected to said second electrode and said third electrode coupled to reference potential.

4,401,900

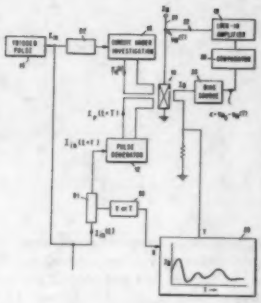
ULTRA HIGH RESOLUTION JOSEPHSON SAMPLING TECHNIQUE

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,674

Int. Cl.³ H03K *17/92*

U.S. Cl. 307—352 **20 Claims**



1. A sampling system for measuring unknown signals, comprising:

a superconducting monitor gate having at least two distinguishable states to which said unknown signal is applied as a control signal along with a sampling pulse and an adjustable bias signal,

switching means for switching the state of said monitor gate, said switching means including a source of said unknown signal, a source of said sampling pulse, and a source of said adjustable bias signal,

noise elimination means for unambiguously defining the switching threshold of said monitor gate, said noise elimination means including means for time averaging the voltage state of said monitor gate and being connected in a feedback loop between said source of bias signals and said monitor gate, said means for time averaging including means for applying an error signal to said source of bias signals in order to adjust the amplitude of said bias signal to that exact amplitude which switches the state of said monitor gate,

a monitor gate current source for providing current through said monitor gate of a predetermined value,

timing means for providing a timing reference and an accurate sampling delay time, said timing means including means for initiating the sampling of said unknown signal by said monitor gate and means for establishing a sampling delay time, said timing means including said source of sample pulses and a delay means for establishing a delay in the application of said sample pulses with respect to the application of said unknown signals,

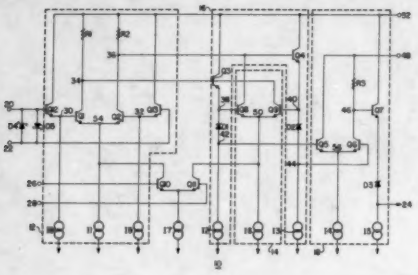
a trigger pulse source for providing trigger pulses to said source of unknown signals and to said source of sampling pulses to initiate the application of said unknown signal to said monitor gate and the application of said sampling pulse to said monitor gate,

means for recording the state of said monitor gate at the instance of each said sampling pulse application, said recording means including means relating the magnitude of said bias signal to the magnitude of said unknown signal at each sampling instant.

4,401,901
COMPARATOR

Sam S. Ochi, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 1, 1981, Ser. No. 269,936
Int. Cl.³ H03K 5/24, 5/08
U.S. Cl. 307—362 8 Claims



1. An integrated circuit apparatus responsive to an unknown input voltage relative to a reference voltage, for providing a digital output voltage at first and second values in accordance with the polarity of the unknown input voltage with respect to the reference voltage, said circuit apparatus comprising:

(a) an input gain stage having at least one input terminal thereof for receiving the unknown input voltage, an output terminal thereof, said input gain stage being disposed for amplifying the difference between the amplitude of the unknown input voltage and that of the reference voltage;

(b) a voltage shift stage having an input terminal coupled to the output terminal of said input gain stage, an output terminal thereof, said voltage shift stage being disposed for translating at a constant rate of translation output signal levels from said input gain stage to second levels relative to the level of the output signal of said input gain stage;

(c) an output gain stage having an input terminal coupled to the output terminal of said voltage shift stage, an output terminal for providing the digital output voltage values of said circuit apparatus, said output gain stage being disposed for amplifying the translated signal levels from said voltage shift stage and further being disposed for translating such signal levels so as to maintain a prescribed voltage differential between the first and second digital output voltage values;

a latch stage having a latch control signal input terminal, said latch stage being coupled to said voltage shift stage for maintaining the signal level in said voltage shift stage in response to a latch enable signal applied to said latch input terminal; and

a current switch disposed for alternately directing a current through said latch stage and said input gain in response to and as a function of said latch enable signal.

4,401,902
HIGH FREQUENCY SWITCHING CIRCUIT

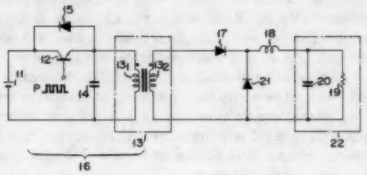
Toshihiro Onodera, Kunitachi; Youichi Masuda, Yokohama; Akira Nakajima, Yokosuka; Yoshio Takamura; Seiji Kajiwara, both of Yokohama, and Shoichi Higo, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 16, 1982, Ser. No. 349,091
Claims priority, application Japan, Feb. 17, 1981, 56-21936
Int. Cl.³ H03K 3/49, 17/60, 19/16
U.S. Cl. 307—415 4 Claims

1. A single-ended high frequency switching circuit comprising:

a single-ended switching circut including a transformer having a primary winding and a secondary winding, a switching element circuit connected between the primary winding of said transformer and a power supply and on-off operated with a predetermined cycle and a predetermined conduction period and a resonance capacitor connected in parallel with said primary winding;

rectifying means connected to the secondary winding of said transformer;



a filtering circuit including a filtering capacitor connected in parallel with a load;

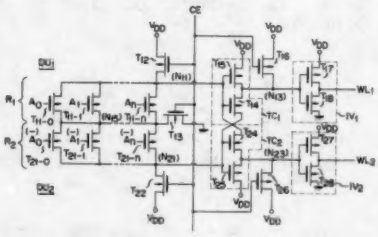
a choke coil connected between said filtering circuit and the output end of said rectifying means; and

an unidirectional circuit element connected in parallel with said filtering circuit and said load via said choke coil and forming a closed circuit passing the current through said choke coil.

4,401,903
MOS DECODER CIRCUIT

Tetsuya Iizuka, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 4, 1980, Ser. No. 183,992
Claims priority, application Japan, Sep. 13, 1979, 54-117747
Int. Cl.³ H03K 19/094
U.S. Cl. 307—449 3 Claims



1. An MOS decoder circuit for decoding an input signal, said circuit being coupled to a clock signal, a supply of a first voltage potential and a second voltage potential and comprising:

first MOS transistors of a first channel type arranged in rows or columns, said first MOS transistors being connected in parallel and receiving at their gates said input signal;

second MOS transistors of said first channel type arranged in rows or columns adjacent to said first MOS transistors, said second MOS transistors being connected in parallel, receiving at their gates said input signal and having their sources connected to the sources of said first MOS transistors;

a third MOS transistor of a second channel type connected between the drains of said first MOS transistors and said supply of said first voltage potential and receiving at its gate said clock signal;

a fourth MOS transistor of said first channel type connected between the sources of said first MOS transistors and said

supply of said second voltage potential and receiving at its gate said clock signal;

fifth and sixth MOS transistors of said first and said second channel type, respectively, the gates of said fifth and sixth MOS transistors being connected together and to the drains of said first MOS transistors, the source of said fifth MOS transistor being connected to the drains of said second MOS transistors, the drains of said fifth and sixth MOS transistors being connected together, and the source of said sixth MOS transistor being connected to said supply of said first voltage potential; and

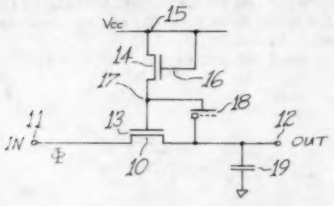
a seventh MOS transistor of said second channel type connected between said drains of said fifth and sixth MOS transistors and said supply of said first voltage potential and receiving at its gate said clock signal.

4,401,904

DELAY CIRCUIT USED IN SEMICONDUCTOR MEMORY DEVICE

Lionel S. White, Jr., and Ngai H. Hong, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 24, 1980, Ser. No. 132,927
Int. Cl.³ H03K 5/13
U.S. Cl. 307—482 **6 Claims**



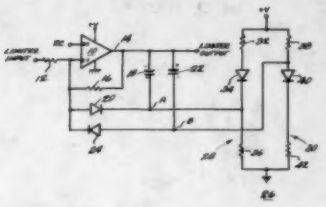
1. A delay circuit for providing a small increment of delay comprising: a series insulated-gate field-effect transistor having a source-to-drain current path and a gate electrode, the current path of said series transistor being connected in series between an input terminal and an output terminal; a precharge circuit having an insulated-gate field-effect transistor for precharging said gate electrode of said series transistor to a voltage level, said precharge transistor having a source-to-drain current path and a gate, said gate electrode of the series transistor being connected to a constant supply voltage through the source-to-drain path of the precharge transistor; means for applying an input voltage to the input terminal, the input voltage having a given transition from one level to another; a capacitance means connected between said output terminal and said gate electrode of the series transistor, the capacitance means being much larger than the inherent parasitic capacitance at the gate electrode of the series transistor and functioning for boosting the voltage on said gate electrode of the series transistor at said given transition by coupling from the output terminal to the gate electrode of the series transistor; wherein the primary electrical path between said input terminal and said output terminal for generating an output representation of said given transition is via said source-to-drain path of said series transistor, and wherein a third transistor connects said output terminal to ground, the third transistor having a gate connected to a precharge circuit to be precharged prior to said transition in order to hold the output terminal at ground at the beginning of said given transistion.

4,401,905

ARRANGEMENT FOR TEMPERATURE STABILIZATION OF A LIMITER

Ronald R. Conger, Elsie, Mich., assignor to General Electric Company, Lynchburg, Va.

Filed Mar. 3, 1981, Ser. No. 240,167
Int. Cl.³ H03K 5/08
U.S. Cl. 307—546 **10 Claims**



1. A limiter circuit, comprising:

an operational amplifier;

a diode feedback circuit for said operational amplifier providing a limiting function, said diode feedback circuit comprising two feedback diodes having voltage-temperature characteristics different from one another; and

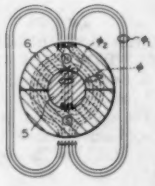
a bias network for temperature compensating the diode feedback circuit, said bias network comprising two temperature compensating bias diodes, associated one each with each of said feedback diodes, for compensating said feedback diodes.

4,401,906

MOTOR WITH IMPROVED TEMPERATURE CHARACTERISTICS

Minoru Isobe, and Hiroshi Kikuchi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,205
Claims priority, application Japan, Mar. 17, 1980, 55-32603
Int. Cl.³ H02K 21/12
U.S. Cl. 310—156 **2 Claims**



1. In a pulse motor comprising a stator assembly having at least a yoke for providing a magnetic path and a coil wound on said yoke, and a rotor assembly rotatably inserted in said stator assembly, having at least an elongated spindle rotatably supported by said stator assembly and a cylindrical permanent magnet made of a ferrite material pierced by said spindle and being symmetrical with respect to said spindle so that the magnetic flux generated by said permanent magnet passes through the yoke of the stator assembly to link with the coil of the stator assembly, the improvement comprising:

said spindle being made of adjusting material having the magnetic characteristic that the magnetic reluctance of the same increases as the temperature of the same increases, and said yoke being made of steel having the magnetic characteristic that the magnetic reluctance of the same is relatively constant irrespective of the change of the temperature.

4,401,907

ELECTRIC MOTOR COIL ELEMENT AND METHOD OF MANUFACTURING THE SAME

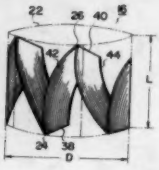
Yoshikuni Nozawa, Chino, Japan, assignor to Entac Co., Ltd., Suwa, Japan

Filed Apr. 14, 1980, Ser. No. 139,725

Claims priority, application Japan, Apr. 21, 1979, 54/49573; Sep. 29, 1979, 54/125643; Sep. 29, 1979, 54/125644; Sep. 29, 1979, 54/125645; Sep. 29, 1979, 54/125646; Sep. 29, 1979, 54/125647; Sep. 29, 1979, 54/125648

Int. Cl.³ H02K *3/04*

U.S. Cl. 310—203 **33 Claims**



1. A method of manufacturing an electric motor coil element, comprising:

helically winding a single wire to form an original concentric winding of flat ring shape;

setting a 2n number (n=1, 2 . . .) of equal division points on the periphery or the original winding to divide said periphery into an even number of substantially equal parts, said equal parts being located between adjacent equal division points;

specifying bending lines which pass through said equal division points at a predetermined angle to a given reference line; and

bending the original winding along said bending lines to provide a plurality of segments of said original winding, said original winding being bent along said bending lines in such a manner that the respective adjacent bending lines project in opposite directions, thereby causing the upper and lower surfaces of respective adjacent segments of said original winding to be alternately exposed on the outer surface of an imaginary block form, thereby forming a motor coil element.

4,401,908

BRUSH-HOLDER ASSEMBLIES FOR ELECTRIC MOTORS, PARTICULARLY FOR TRACTION MOTORS

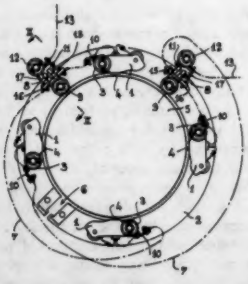
Louis Cabaussel, St. Bonnet de Mure, France, assignor to Societe L. Ferraz, Lyons, France

Filed Feb. 25, 1982, Ser. No. 352,277

Claims priority, application France, Mar. 20, 1981, 8105794

Int. Cl.³ H02K *13/12*

U.S. Cl. 310—229 **3 Claims**



1. In an electric motor of the type having a brush holder support ring rotatable in a member fixed in the motor frame and having fixed-position current conducting cables for supplying current to the brush holders, the assembly comprising for each current conducting cable:

(a) a first insulating support, the support having a conductive base fixed thereto and connected with said cable;

(b) a second insulating support fixed to the support ring and having a conductive base connected by a conducting segment to brush holders of the same polarity on the ring;

(c) a set of resilient split rings of different diameters secured to the base of one of said insulating supports and tightened thereon between arcuate seat means, the rings extending toward the conductive base on the other of said insulating supports, and the split rings in each set having all of their ends aligned and extending toward said other conductive base;

(d) blade means secured to the conductive base of said other insulating support and extending toward said one insulating support, the blade means being disposed to enter the split rings in rubbing contact with their aligned ends when the support ring is rotated to align said conductive bases; and

(e) the different diameters of the split rings of each set being such that when the set is tightened between the arcuate seat means the ends of the different rings where they contact the blade means are substantially spaced from each other.

4,401,909

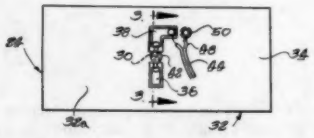
GRAIN SENSOR USING A PIEZOELECTRIC ELEMENT

Edmund J. Gorsek, Springfield, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Apr. 3, 1981, Ser. No. 250,570

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—323 **14 Claims**



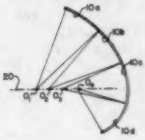
1. A grain sensor comprising: a piezoelectric element, a relatively thin, flat sounding board of substantially greater surface area than said piezoelectric element, mounting means for mounting said piezoelectric element to a first surface of said sounding board whereby forces experienced by said sounding board due to grain particles impinging thereupon are imparted to said piezoelectric element, rigid frame means for surroundingly engaging side edges of said sounding board thereby holding a second surface thereof, opposite said first surface exposed to impingement by said grain particles, said rigid frame means including inwardly extending flange means for substantially covering a peripheral edge portion of said second surface, a base member having a surface substantially congruent with said sounding board surfaces and mountable in facing relation to said first sounding board surface for substantially enclosing said piezoelectric element therebetween, resilient spacer means interposed between said facing surfaces of said sounding board and said base member, said frame means further including flexible side wall portions and inwardly extending locating means formed on said flexible side wall portions at locations spaced apart from said inwardly extending flange portions for snappingly engaging with said base member and for locating and engaging said sounding board, said resilient spacer means and said base member between said locating means and said inwardly extending flange portions.

4,401,910

MULTI-FOCUS SPIRAL ULTRASONIC TRANSDUCER

Henry P. Beerman, Lexington, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Filed Nov. 30, 1981, Ser. No. 325,679
Int. Cl.³ H03J 3/28
U.S. Cl. 310—369 14 Claims



13. An ultrasonic transducer comprising:

a housing;

a piezoelectric element supported in the housing and having a cylindrical spiral surface, the surface having respective sections along the length thereof, each of a diffrent focal length;

a front electrode provided on the front surface of each section of the piezoelectric element; and

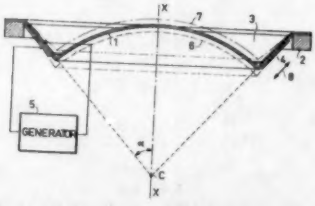
a rear electrode provided on the rear surface of the piezoelectric element.

4,401,911

ACTIVE SUSPENSION PIEZOELECTRIC POLYMER TRANSDUCER

Pierre Ravinet, and Francois Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 2, 1981, Ser. No. 239,642
Claims priority, application France, Mar. 4, 1980, 80 04838
Int. Cl.³ H01L 41/08
U.S. Cl. 310—800 13 Claims



1. An elctromechanical transducer comprising:

a rigid support member; and

a self supporting radiating structure having a marginal portion attached to said rigid support, said self supporting radiating structure including:

a polymer material active wall having first and second edge regions, said first edge region being attached to said rigid support member, and

a closure portion, made of a film shaped in the form of a spherical surface portion, connected to said second edge region of said active wall,

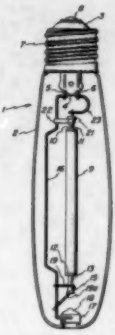
said active wall being formed and positioned such that in response to an electrical excitation of said transducer, said second edge moves along marginal radii of said spherical surface portion.

4,401,912

METAL VAPOR ARC LAMP HAVING THERMAL LINK DIMINISHABLE IN HEAT CONDUCTION

Francois D. Martzloff, Schenectady, and Marshall G. Jones, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 4, 1981, Ser. No. 260,245
Int. Cl.³ H01J 1/02, 7/24, 61/52
U.S. Cl. 313—17 14 Claims



1. An arc discharge lamp comprising:

an outer vitreous envelope;

a pair of lead-in conductors sealed into said envelope;

an arc tube supported within said outer envelope and connected to said lead-in conductors;

an ionizable medium sealed within said arc tube and including vaporizable metal in a quantity exceeding that vaporized during operation, the heat balance in said lamp determining a cold spot in said arc tube whereat excess metal collects, and the temperature of said cold spot determining the metal vapor pressure in said arc tube and the voltage drop across said arc tube;

a metal member in said lamp, the heat loss from which influences significantly the temperature of said cold spot; and

a thermal link to said metal member, said thermal link having at least one hole formed therein such that the heat conductive cross section thereof in the region of said hole is decreased to a value greater than zero, said hole being formed in order to increase said voltage drop in the completed lamp without breaking open said envelope.

4,401,913

DISCHARGE LAMP WITH MOUNT PROVIDING SELF CENTERING AND THERMAL EXPANSION COMPENSATION

Francis R. Koza, Salem, and Richard A. Parrott, Merrimack, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 3, 1981, Ser. No. 270,153
Int. Cl.³ H01J 61/52
U.S. Cl. 313—25 9 Claims

1. An arc discharge lamp comprising:

an hermetically sealed outer glass envelope having a base portion at one end, with a pair of lead-in conductors extending therefrom into said envelope, and a dome portion at the other end opposite said base portion;

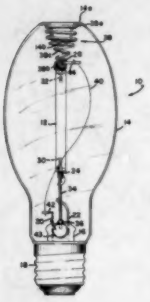
an hermetically sealed elongated arc tube disposed coaxially within said outer envelope, said arc tube having first and second external conductive terminals at respective first and second ends thereof respectively connected to electrodes disposed within said arc tube at said first and second ends thereof;

respective means within said outer envelope electrically

connecting said pair of lead-in conductors to said first and second terminals of the arc tube, respectively;

means within said outer envelope extending from said base portion for supporting said first end of the arc tube coaxially within said outer envelope, said first end of the arc tube facing said base portion;

a coiled spring at one end engaging the second terminal of said arc tube and at the opposite end engaging the dome



portion of said outer envelope, said spring being coaxially disposed in a partially compressed state within said outer envelope between said second end of the arc tube and said dome portion of the outer envelope; and

the shape of the dome portion of said outer envelope and the shape of said spring engaged therewith being cooperatively configured to constrain said spring in a coaxially centered position within said outer envelope.

4,401,914

LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMP

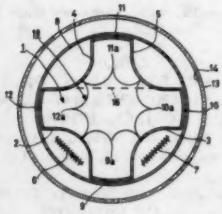
Gustaaf A. Wesselink; Hendrik Roelofs, and Cornelis H. M. Van Bommel, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 11,471, Feb. 12, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,847

Claims priority, application Netherlands, Feb. 14, 1978, 7801635

Int. Cl.³ H01J *61/22, 61/34, 61/74, 5/16*

U.S. Cl. 313—111 **6 Claims**



1. A low-pressure sodium vapor discharge lamp comprising a hollow inner member surrounded by and nesting with an outer transparent member, a reflecting member being disposed in said inner member, the wall of at least one of the members having one or more grooves and having intervening portions between the grooves which extend near to the wall of the other member; said lamp having a folded discharge space formed by means of said grooves which are arranged serially, said intervening portions located between the grooves facing the wall of the other member extending parallel to that wall and leaving a gap with said wall having sufficient width and length to prevent short-circuitry of the discharge.

4,401,915

IGNITION PLUG FOR AN INTERNAL COMBUSTION ENGINE

Takeaki Kashiwara; Ryohei Kashiwara, and Hideaki Kashiwara, all of 5-chome 39 No. 3 Yamasaka-cho, Higashisumiyoshi-ku, Osaka, Japan

Continuation of Ser. No. 974,181, Dec. 28, 1978, abandoned. This application Apr. 6, 1981, Ser. No. 251,546

Claims priority, application Japan, Dec. 28, 1977, 52-159822; Sep. 29, 1978, 53-121107

Int. Cl.³ H01T *13/20*

U.S. Cl. 313—142 **7 Claims**

1. A spark plug for an internal combustion engine having a grounded outer cylindrical shell and an axially extending centrally positioned insulated electrode, an elongated ground electrode extending radially inwardly from said outer shell with its free end positioned at a location spaced a short axial distance away from the end of said insulated electrode, the width of the ground electrode along its length in a direction at right angles to the axis of the shell being substantially greater than its thickness in the axial direction and being provided with at least one opening extending axially therethrough, the surface of said ground electrode on the side facing away from the end of said insulated electrode being generally concave in transverse cross section along the length thereof.

4,401,916

HIGH-PRESSURE DISCHARGE LAMP

Alfred E. T. Glenny; Johannes A. J. M. van Vliet, and Petrus A. M. Weerdesteijn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,018

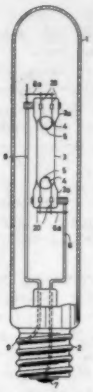
Claims priority, application Netherlands, Apr. 3, 1979, 7902574

Int. Cl.³ H01J *61/073, 61/18*

U.S. Cl. 313—628 **8 Claims**

1. A high-pressure discharge lamp having a discharge vessel containing an ionizable filling and first and second main electrodes between which a discharge is maintained during operation of the lamp, at least said first electrode comprising a resistive element comprising at least a continuous wire which is at least partly coiled and having a V-shaped with two branches extending from a single point, each branch having substantially the same electrical resistance, said single point facing the dis-

charge and constituting the starting point of the discharge, said resistive element being in incandescent filament, which con-



sists of a continuous coil and that the discharge-facing part of the coil is supported by a supporting wire.

4,401,917

COLOR DISPLAY TUBE INCLUDING CYLINDRICAL DIPOLE CORRECTION MAGNETS

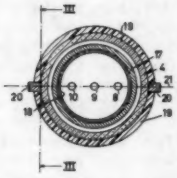
Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1980, Ser. No. 190,148

Claims priority, application Netherlands, Oct. 19, 1979, 7907717

Int. Cl.³ H01J 29/56, 29/76

U.S. Cl. 313—413 9 Claims



1. A color display tube comprising a glass envelope having a display window, a cone and a neck, a display screen on the inside of the display window and an in-line electron gun system in the neck, said in-line electron gun system generating three electron beams which converge on the display screen, the central electron beam having a central path that coincides substantially with the axis of the glass envelope and the two outermost electron beams being situated symmetrically with respect to said central beam, said envelope comprising a magnetized means for maintaining a static magnetic multipole field near the output of said in-line electron gun system for carrying out static beam corrections, a magnetizing means comprising a system of deflection coils around the neck-cone transition of the envelope for deflecting said electron beams over the display screen in two mutually perpendicular directions, and further comprising a correction magnet provided outside the neck of said envelope near the output of said in-line electron gun system and near at least one outermost electron beam, said correction magnet forming a magnetic dipole that is intersected by the plane of said electron beams, and said correction magnet being small with respect to its distance to said one outermost electron beam.

4,401,918

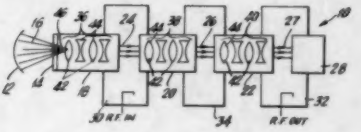
KLYSTRON HAVING ELECTROSTATIC QUADRUPOLE FOCUSING ARRANGEMENT

Alfred W. Maschke, East Moriches, N.Y., assignor to the United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Nov. 10, 1980, Ser. No. 205,070

Int. Cl.³ H01J 23/08

U.S. Cl. 315—5.34 5 Claims



1. A klystron comprising means for emitting a plurality of electron beams, means for accelerating the electron beams in a given direction, a number of drift tube sections successively aligned relative to one another in the direction of the electron beams for velocity modulating the electron beams in response to radio frequency energy coupled to said drift tube sections, and a number of electrostatic quadrupole arrays successively aligned relative to one another along at least one of said drift tube sections in the direction of the electron beams for focusing the electron beams and maintaining the electron beams in spaced apart parallel relationship to one another, each of said electrostatic quadrupole arrays including a plurality of electrode in a common plane forming a different quadrupole for each of the electron beams.

4,401,919

INDIRECTLY HEATED WEHNELT CATHODE

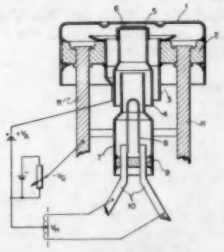
Eberhard Weiss, Stuttgart, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,328

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029853

Int. Cl.³ H05B 39/04, 41/36; H01J 1/20

U.S. Cl. 315—107 4 Claims



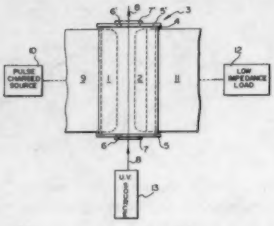
1. An indirectly heated Wehnelt cathode, especially for the use with cathode-ray tubes such as oscillograph, television and color television picture tubes in which, on the outside of the base plate of a cathode sleeve, there is arranged an electron-emitting layer which, by a source of heat arranged within the cathode sleeve, is excited to emit electrons, wherein the improvement comprises:

said source of heat being a directly heated triode system having a cathode, a control electrode and an anode, the inside of said base plate of said cathode sleeve serving as the anode.

4,401,920
LASER TRIGGERED HIGH VOLTAGE RAIL GAP SWITCH

Roderick S. Taylor, Ottawa; Kurt E. Leopold, Carp, and A. John Alcock, Ottawa, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed May 11, 1981, Ser. No. 262,685
Int. Cl.³ H05B *37/02*; H01J *17/04*
U.S. Cl. 315—150 **12 Claims**



1. A high voltage rail gap switch for a pulse charged source comprising:

a pair of parallel elongated electrodes, spaced to have a gap between the electrodes;

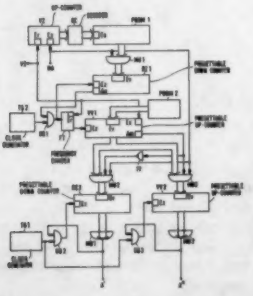
enclosure means, the electrodes being located in the enclosure means and the enclosure means containing a gas mixture at a total pressure above atmospheric pressure, the gap mixture including SF_6, Ar and a small concentration of an organic additive; and

coherent UV radiation source means for directing a pulsed beam through the gas mixture substantially parallel to the pair of electrodes for initiating multichannel breakdown in the gap between the electrodes, the organic additive being matched to the UV radiation wavelength for producing photoionization for the production of a predetermined number of initial electrons in the gap.

4,401,921
MONOLITHIC INTEGRATED VERTICAL-DEFLECTION CIRCUIT FOR TELEVISION SETS WITH TANGENT-CORRECTED, LINE-FREQUENCY-DERIVED DIGITAL SIGNAL GENERATION

Gerhard Achtstaetter, Gundelfingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,638
Claims priority, application European Pat. Off., Dec. 8, 1980, 80107715.7; Jun. 16, 1981, 81104620.0
Int. Cl.³ H01J *29/70*, *29/72*
U.S. Cl. 315—364 **1 Claim**



1. Monolithic integrated vertical-deflection circuit for television sets with tangent-corrected line-frequency-derived digital generation of the pulse-width-modulated signal for directly driving a class-D push-pull vertical-deflection stage or for driving a class-B push-pull analog vertical-deflection stage via an integrator and

with an up-counter (VZ),

with a first programmable read-only memory (PROM1),

with a second programmable read-only memory (PROM2), which holds a digital word corresponding the deflection current at the top or bottom of the image,

with a first clock generator (TG1) whose frequency is on the order of the color-subcarrier frequency,

with a first counter which participates in the generation of the drive signal for the upper (or lower) half of the image, and

with a second counter which participates in the generation of the drive signal for the lower (or upper) half of the image, the count inputs of said first and second counters being coupled to the output of the first clock generator (TG1),

characterized by the following features:

the count input (Ez) and the reset input (Er) of the up-counter (VZ) are fed with the horizontal deflection pulses (HA) and the vertical synchronizing pulses (VS), respectively, and the count outputs of the up-counter (VZ) are connected to the address inputs (Ea) of the first programmable read-only memory (PROM1) via a decoder (DC);

the S-shaped characteristic of the deflection-stage current is approximated by portions of constant slope whose associated slope values are stored in the first programmable read-only memory (PROM1) under one address each;

the output of a second clock generator (TG2) is connected via one of the input-output paths of a first AND gate (UG1) to the count input (Ez) of a first presettable down-counter (RZ1), whose parallel preset input (Ev) is connected to the parallel output of the first programmable read-only memory (PROM1) via first input-output paths of a first multiple ANd gate (MU1), and whose zero-state output (AO) is coupled to the other input of the first AND gate (UG1), while the second inputs of the first multiple AND gate (MU1) are fed with the horizontal-deflection pulses (HA);

the output of the first AND gate (UG1) is connected via a frequency divider (FT) to the count input (Ez) of a first presettable up-counter (VV1) whose preset enable input (Es) is fed with the vertical synchronizing pulses (VS) and whose parallel preset input (Ev) is connected to the parallel input of the second programmable read-only memory (PROM2);

the output of the first clock generator (TG1) is connected via one of the input-output paths of a second AND gate (UG2) to the count input of a second presettable down-counter (RZ2) forming the first counter, and via one of the input-output paths of a third AND gate (UG3) to the count input of a second presettable up-counter (VV2) forming the second counter;

the count outputs of the first presettable up-counter (VV1) are connected to the parallel preset input (Ev) of the second presettable down-counter (RZ2) via first input-output paths of a second multiple AND gate (MU2);

the second inputs of the second multiple AND gate (MU2) are fed with the horizontal-deflection pulses (HA), and the third inputs of the second multiple AND gate (MU2) are connected to the output of an inverter (IV) having its input connected to the output (Am) of the first presettable up-counter (VV1) for the most significant bit;

the count outputs of the first presettable up-counter (VV1) are connected to the parallel preset input (Ev) of the second presettable up-counter (VV2) via first input-output paths of a third multiple AND gate (MU3);

the second inputs of the third multiple AND gate (MU3) are fed with the horizontal-deflection pulses (HA), and the third inputs of the third multiple AND gate (MU3) are connected to the output (Am) of the first presettable up-counter (VV1) for the most significant bit;

the count signals of the second presettable down-counter (RZ2) are connected via a first multiple OR gate (MO1) to the drive-signal output (A') for one half of the image, which output is also connected to the other input of the second AND gate (UG2);

the count outputs of the second presettable up-counter (VV2) are connected via a second multiple OR gate (MO2) to the drive-signal output (A'') for the other half of the image, which output is also connected to the other input of the third AND gate (UG3), and

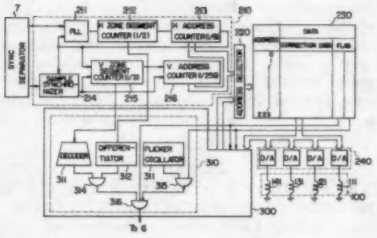
the frequency of the second clock generator (TG2) is chosen so that when the first presettable down-counter (RZ1) is set to the highest slope value, its zero state is reached within one line period.

4,401,922

CONVERGENCE DISTORTION CORRECTION METHOD AND APPARATUS FOR COLOR CATHODE-RAY TUBE

Yasuji Kamata; Hiroshi Kuwahara, both of Hitachi; Jushi Ide, Mito; Kenkichi Yamashita, Katsuta, and Koji Takahashi, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,916
Claims priority, application Japan, Jun. 24, 1981, 56-98988
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—368 **17 Claims**



1. A convergence distortion correction method for a raster-scanned color CRT including an electron gun assembly for generating a plurality of electron beams, a display screen and a dynamic convergence magnet assembly having a plurality of coils for correcting convergence distortions in the display screen of the electron beams, comprising:

a first step of dividing the display screen of the CRT into a plurality of zones and repetitively generating addresses of the zones on the basis of a signal for raster scan regenerated from an input video signal;

a second step of selecting addresses of zones to be subjected to the adjustment of convergence distortion from said plurality of zones and setting flags in flag bit fields associated with data storage fields of a digital memory at addresses specified by said selected zone addresses;

a third step of generating guide pattern signals by referring to said flags of said digital memory while scanning said digital memory by the zone addresses, to display guide patterns on said selected zones of the CRT; and

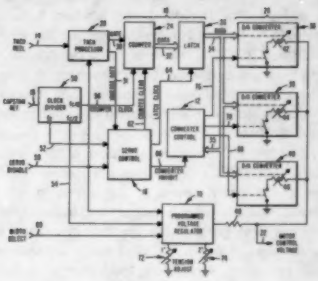
a fourth step of utilizing the displayed guide patterns to adjust convergence distortions in said selected zones and storing correction data based on the result of the adjustment in the data storage fields of said digital memory at the addresses corresponding to said selected zones.

4,401,923

DIGITAL OPEN LOOP TAPE TENSION CONTROL CIRCUIT FOR TAPE RECORDERS AND THE LIKE

David C. O'Gwyna, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 30, 1980, Ser. No. 202,210
Int. Cl.³ B65H *59/38*
U.S. Cl. 318—6 **15 Claims**



1. A digital circuit for controlling the tension on a capstan driven tape being pulled onto a reel by a reel motor, comprising;

means including counter means coupled to latch means for continuously supplying successive binary numbers indicative of the instantaneous tape pack diameter;

means for supplying the period of rotation of the reel to the counter means and including, means for continuously generating reel tach pulses indicative of the instantaneous reel speed, and means for generating capstan reference pulses indicative of the tape speed; and

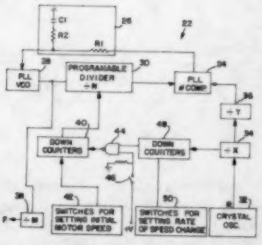
D/A converter means coupled to the latch means and including continuously selectable array means of precision resistors for generating a continuous succession of analog motor control voltages in response to the successive binary numbers.

4,401,924

SPEED CONTROL APPARATUS FOR WINDING LINEAR MATERIAL

Raymond H. Grover, Santa Clara, Calif., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 8, 1981, Ser. No. 300,411
Int. Cl.³ B65H *59/38*
U.S. Cl. 318—6 **8 Claims**



8. An apparatus for winding linear material into a wound package comprising:

(a) means for collecting linear material into a wound package;

(b) a motor for rotating said collecting means;

(c) a drive means for controlling the speed of said motor in

proportion to the frequency of a signal applied to said drive means; and

(d) an electronic circuit consisting of two parts both activated by the same crystal controlled reference oscillator which produces a first frequency, said first frequency is reduced by a first set of dividers to produce a second frequency to be fed to a first part of the electronic circuit, said second frequency further reduced by a second set of dividers to produce a third frequency which is fed to a second part of the electronic circuit which includes a phase lock loop circuit wherein the third frequency is multiplied by the contents of a programmable divider which is programmed by a first set of down counters which are loaded with a first number from a first set of manually settable binary coded decimal switches to produce a fourth frequency, said fourth frequency being divided by a third set of dividers to produce a fifth frequency, said fifth frequency is a frequency in Hertz equivalent to the initial speed of the motor in revolutions per minute, simultaneously accepting the second frequency into the first part of the electronic circuit wherein the second frequency is divided by a second set of down counters which have been loaded with a second number from a second set of manually settable binary coded decimal switches such that the second number stored in the second set of down counters is decremented by one for each cycle defined by the second frequency divided by the second number until the contents of the second set of down counters becomes zero, whereupon the second number set by the second set of manually settable switches is reloaded into the second set of down counters, and, simultaneously, a pulse is sent to the first set of down counters of the first part of the electronic circuit decrementing the first number stored in the programmable divider by one for each pulse received from the second part of the electronic circuit to produce an output frequency which is decremented uniformly over time.

4,401,925

MEANS OF ENERGIZING VIBRATING FEEDERS

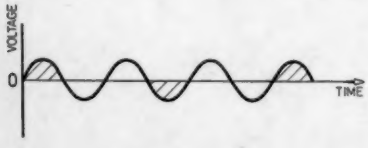
James E. Brander, Baulkham Hills, Australia, assignor to International Comustion Australia Limited, Rydalmere, Australia

Continuation-in-part of Ser. No. 96,604, Nov. 21, 1979, abandoned. This application Feb. 8, 1980, Ser. No. 119,696

Claims priority, application Australia, Nov. 24, 1978, PD6904

Int. Cl.³ H02K *33/00*

U.S. Cl. 318—114 **11 Claims**



1. In a method of energizing an electromagnetic vibrator of the kind having an electromagnet for driving the vibrator, switching means in series with the coil of said electromagnet, and means for connecting the serially-connected switching means and coil across an alternating current power supply, the improvement comprising operating the switching means at a rate which is an odd fraction, greater than one-quarter, of the alternating current frequency of said power supply so as to cause each successive energization of said electromagnet to be in an alternate direction and exist for at least one half period of the alternating current frequency of said power supply.

4,401,926

PULSE CONTROLLERS

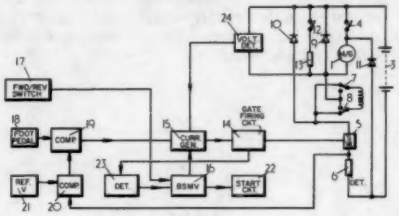
John Morton, and Keith D. Stevens, both of Stockport, England, assignors to Cabeform Limited, Cheshire, England

Filed Feb. 13, 1978, Ser. No. 877,526

Claims priority, application United Kingdom, Feb. 11, 1977, 5853/77; Mar. 17, 1977, 11459/77; Dec. 30, 1977, 54383/77; Dec. 30, 1977, 54384/77

Int. Cl.³ H02P *3/14*

U.S. Cl. 318—376 **15 Claims**



1. A method for controlling the regenerative braking of a D.C. electric motor having a plugging diode normally forming a short circuit around the armature of the motor, wherein an electronic switch is provided in the motor armature circuit to control regenerative braking current, comprising the steps of: opening the short-circuit, alternately rendering the electronic switch conductive and non-conductive in a class 3 mode of operation, and choosing and maintaining a predetermined interrelationship of the conductive and non-conductive periods of the switch such that the switch alternates between its conductive and non-conductive states, regardless of the ratio between the periods and regardless of the motor speed, at a rate sufficient to automatically maintain the instantaneous motor current within desired maximum and minimum limits, said periods being determined solely by said predetermined relationship without any additional step for setting said desired maximum and minimum limits of instantaneous motor current.

4,401,927

PROCESS AND DEVICE TO CONTROL THE ELECTRIC BRAKING OF A DIRECT CURRENT MOTOR

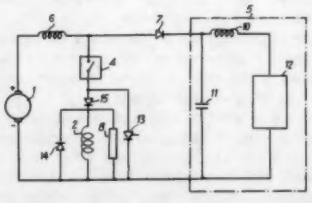
M. N'Guyen U. Thuy, La Verpilliere, France, assignor to Societe CEM-Compagnie Electromecanique & CIE SNC., Paris, France

Filed Apr. 16, 1981, Ser. No. 254,651

Claims priority, application France, Apr. 16, 1980, 80 08497

Int. Cl.³ H02P *3/14*

U.S. Cl. 318—379 **7 Claims**



1. In a direct current motor of the type having a field coil and a current chopper connected in parallel with the motor armature between the armature and the load and wherein the field coil is excited by current from the armature when the chopper is closed during braking, a method for controlling the electric braking of the motor comprising the steps of:

providing a shunt device across said field coil;

regulating the current in said armature by means of said chopper; and

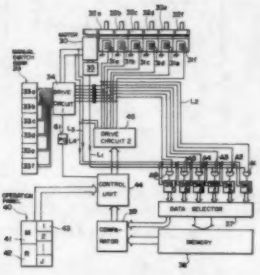
regulating the current in said field coil by adjusting the flow of current through said shunt device, whereby the braking force of the motor is maintained at a level lower than the rated power of the motor.

4,401,928

SEAT POSITION AUTOMATIC ADJUSTING DEVICE FOR AN AUTOMOTIVE VEHICLE

Ken Kamijo, Yokosuka, and Hideyuki Nagashima, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Nov. 20, 1980, Ser. No. 208,681
Claims priority, application Japan, Nov. 21, 1979, 54-150013
Int. Cl.³ G05B 5/00
U.S. Cl. 318—466 **6 Claims**



1. A seat position automatic adjusting device which operatively and selectively adjusts each of a plurality of seat members to a desired position and returns the currently adjusted set position of each of the seat members to a preset position defined by originally adjusted seat position data, the seat members including a seat, a a seat cushion fixed on the seat, a seat back, and a head restraint attached on the seat back, which comprises:

a reversible motor;

a seat member adjusting mechanism incorporated into each seat member and operatively engaged with said reversible motor so as to move the corresponding seat member to a required position determined by a number of revolutions and rotating direction of said reversible motor;

a motor drive circuit for driving said reversible motor to rotate selectively in the normal or reverse direction by a required number of revolutions with said seat member adjusting mechanism engaged with said reversible motor; and

a control circuit connected to said reversible motor and motor drive circuit for detecting and storing the number of revolutions and rotating direction of said reversible motor when said motor drive circuit engages said reversible motor with said seat member to set the corresponding seat member and for operatively outputting a signal to said motor drive circuit to drive said reversible motor to rotate selectively in the normal or reverse direction according to the number of revolutions and rotating directions of said reversible motor stored therewithin so that the corresponding seat member returns to the original position;

wherein said seat member adjusting mechanism includes means for selectively adjusting each seat member position so as to move the seat position up-and-down or back-and-forth, to recline the seat back forward or backward with respect to a vertical position, to incline the seat cushion and seat support portion with respect to a horizontal position to tilt a lumbar support position of the seat back forward or rearward, or to extend the head restraint in up-or-down direction with respect to the seat back, and said seat member adjusting mechanism comprises:

an actuator for applying a turning force to the corresponding seat member so as to move the corresponding member to a required position; and

an electromagnetic clutch provided with said corresponding actuator for engaging an output rotating shaft of said reversible motor with said corresponding actuator when said motor drive circuit drives said reversible motor;

and wherein said control circuit comprises:

rotation number detector means coupled to an output rotating shaft of said reversible motor for outputting a pulse train according to the rotation of said reversible motor, the number of which corresponds to the amount of revolution of said reversible motor;

a seat position data counter connected to said rotation number detector for counting the number of pulses fed from said rotation number detector decrementally or incrementally according to the rotating direction of said reversible motor;

an operation panel having a first switch for outputting a first command signal to store the counted value of said seat position data counter when manually turned on, a second switch for outputting a second command signal to send the counter value of said seat position data counter into said motor drive circuit so as to return each seat member to the preset position when manually turned on, and a plurality of address switches, each address thereof specified respectively for an individual user of the seat for activating the first and second command signals only when manually turned on;

a memory for storing the counted value of said seat position data counter in response to the first command signal from said first switch activated by any one of the address switches of said operation panel and outputting the counter value of said seat position data counter stored therewithin in response to the second command signal from said second switch activated by any one of the address switches of said operation panel;

a comparator for comparing the originally adjusted seat position data stored in said memory with the currently counted value of said seat position data counter; and

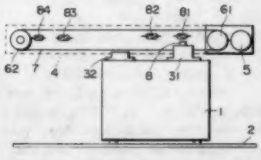
a control unit responsive to said comparator for outputting a signal to said motor drive circuit to drive said reversible motor to rotate in the normal or reverse direction according to the number of revolutions and rotating directions of said reversible motor based on the compared result within said comparator in response to the first command signal activated by any one of the address switches received from said operation panel.

4,401,929

CONTROL APPARATUS OF AUTOMATIC DOOR

Kuniyuki Odaka; Yukio Yamamura; Koichi Ishino, all of Hikone, and Masayuki Nakamura, Kadoma, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 8, 1981, Ser. No. 281,378
Claims priority, application Japan, Jul. 15, 1980, 55-097283
Int. Cl.³ H02P 3/00
U.S. Cl. 318—466 **12 Claims**



1. A control apparatus for an automatic door comprising:

motor means for driving said door to thereby open and close said door;

sensor means for detecting the presence of traffic for passage

through said door and producing a detection signal upon detection thereof;

control means responsive to said detection signal for controlling said motor means to open said door, said means for controlling including,

lapse time period determining means for calculating the time lapse between the start and the end of the period of time required by said motor means to drive said door open, said lapse time period determining means producing an elapsed time signal indicative thereof,

full open lapse time storage means responsive to said opening time lapse signal for storing the period of time required to fully open said door,

target time period setting means responsive to said full open lapse time storage means for setting a target opening time period a fraction of but no greater than said period of time stored in said full open lapse time storage means comparison means responsive to said lapse time period determining means and said target time period setting means for detecting the coincidence between said target opening time period and said lapse time period and for producing a brake signal upon coincidence thereof,

said control means braking said motor to stop said door in an open position upon coincidence thereof;

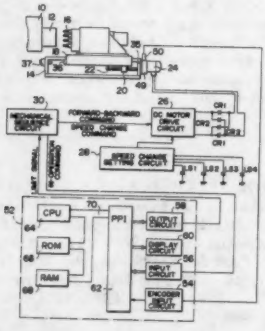
said door opening to a position which varies according to the ratio between said target opening time period and said period of time stored in said full open lapse time storage means.

4,401,930

METHOD OF SENSING POSITION OF MOVABLE BODY AND APPARATUS THEREFOR

Yoshito Kato; Hideyuki Matsubara, and Toshio Hashimoto, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 30, 1980, Ser. No. 221,266
Int. Cl.³ G05B *19/28*
U.S. Cl. 318—603 **11 Claims**



1. A method of sensing a position of a movable body by directly or indirectly converting a unit movement of a movable body into digital pulse signals, comprising:

a first step of counting said pulse signals;

a second step of sensing the coincidence of the number of said pulse signals counted in said first step with a first predetermined pulse number corresponding to a predetermined position preset and generating position sensing signals in response to said coincidence; and

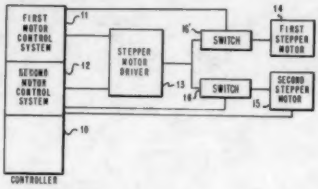
a third step of sustaining said position sensing signals emitted in the second step after said movable body leaves said predetermined position for the duration of a second predetermined pulse number corresponding to a predetermined stroke, said sustained position sensing signals indicating that said movable body has reached said predetermined position and is within a predetermined stroke from said predetermined position.

4,401,931

APPARATUS ACTUATED BY A PAIR OF STEPPER MOTORS WITH SHARED DRIVE

Robert W. Kulterman, Austin; James M. Rakes, Leander, and Robert H. Sweat, Jr., Round Rock all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,070
Int. Cl.³ H02K *37/00*
U.S. Cl. 318—696 **6 Claims**



1. Stepper motor control apparatus comprising

a first stepper motor,

a first control system for operating said first stepper motor in an open loop mode,

a second stepper motor,

a second control system for operating said second stepper motor in a closed loop mode, and

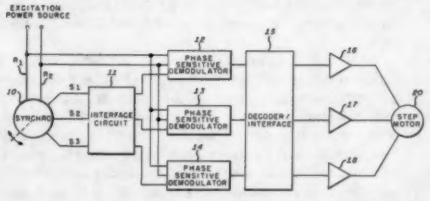
stepper motor driving means responsive to said first control system for driving said first stepper motor and responsive to said second control system for driving said second stepper motor.

4,401,932

SYNCHRO-TO-STEP DATA CONVERTER

James E. Hermansdorfer, and William T. Spurgin, both of Charlottesville, Va., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,477
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **14 Claims**



1. A synchro-to-step data converter for coupling the output of a synchro transmitter to a step motor, comprising:

means for receiving three wire synchro voltages and a reference voltage;

phase sensitive detector means for providing d.c. output voltages as the modulated synchro voltages change phase;

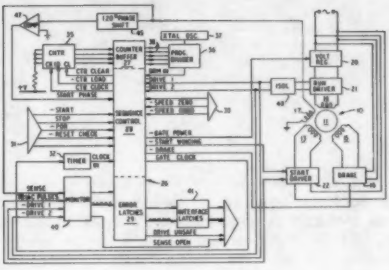
bistable pulse generator means responsive to said d.c. phase sensitive output voltages for generating step data command signals in a three bit binary code; and

means for coupling said bistable pulse generator means to said step motor so that said step data command signals in said three bit binary code drive said step motor.

4,401,933
MOTOR CONTROL SYSTEM FOR A SINGLE PHASE INDUCTION MOTOR

John C. Davy, Winchester; Brian P. Fenton, Totton, and John G. Ramage, Eastleigh, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,100
Claims priority, application European Pat. Off., Nov. 28, 1980, 80304294
Int. Cl.³ H02P 1/42
U.S. Cl. 318—778 5 Claims



1. A system for rotating a member from a rest position to a predetermined constant operating speed comprising a single phase induction motor and a motor control system;

said single phase motor comprising:

(1) a cage type rotor coupled to said member; and

(2) a stator having at least:

(a) a run winding; and

(b) a start winding spatially displaced in phase from said run winding;

said control system comprising:

(1) first switch means for selectively connecting a single phase alternating power line voltage to said start winding in response to a start control signal, said alternating power line voltage having a constant frequency which is substantially below the optimum supply frequency for rotating said motor at said constant operating speed;

(2) means selectively connectable to said run winding for developing a rotating magnetic field to cause initial rotation of said member from said rest position;

(3) a run drive circuit for supplying a run voltage to said run winding including means for varying the frequency of said run voltage between a frequency approximating the frequency of said power line voltage and said optimum supply frequency of said motor in accordance with a speed control signal; and

(4) second switch means for selectively switching said run winding between said rotating magnetic field developing means and said run drive circuit in response to a run control signal; and

(5) means for supplying said control signals to said first and secnd switch means in a predetermined sequence which causes

(a) said start winding and said run winding to be initially energized simultaneously to produce a high starting torque which rapidly accelerates said motor to a minimum operating speed determined by said constant frequency;

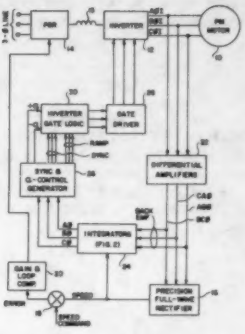
(b) said start winding to be disconnected from said line voltage and said run winding to be switched to said run driver circuitry after a predetermined time; and

(c) the frequency of said run voltage to be increased to said optimum supply frequency to accelerate said motor to said constant operating speed.

4,401,934
ADAPTIVE CONTROL SYSTEM FOR LINE-COMMUTATED INVERTERS

Carlisle R. Dolland, and David A. Bailey, both of Torrance, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 291,132
Int. Cl.³ H02P 5/40
U.S. Cl. 318—798 4 Claims



1. In a control system for a permanent-magnet motor driven by a multiphase line-commutated inverter, said control system having means for integrating the back EMF of each phase of said motor for use in generating system control signals for said inverter, an improvement comprising

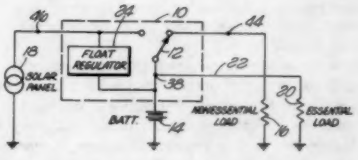
means for generating a signal proportional to motor speed, and

adaptive means responsive to said motor speed signal for increasing the attenuation of low frequencies in the back EMF of each phase of said motor by said integrating means as said motor speed increases.

4,401,935
CHARGE CONTROL APPARATUS AND METHOD

John W. Yerkes, Granada Hills, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 4, 1982, Ser. No. 354,835
Int. Cl.³ H02J 7/00
U.S. Cl. 320—9 14 Claims



1. Apparatus for controlling the charging of a rechargeable electrical energy storage device which generates a storage device electrical signal, by an electrical energy source which generates a source electrical signal, and controlling the discharging of the device through a load, the source having a charging output terminal and the load having a load input terminal, comprising:

relay means actuable between a first condition coupling the storage device to the input terminal of the load for application of the storage device electrical signal to the load, and a second condition coupling the storage device to the

output terminal of the source for charging of the storage device by the source electrical signal;

means for detecting a preselected threshold level of the source electrical signal;

means for actuating the relay means from the first condition to the second condition in response to said preselected threshold level; and

means for detecting a preselected charged level of the storage device electrical signal;

said actuating means including means for resetting the relay means from the second condition to the first condition in response to said preselected charged level.

4,401,936

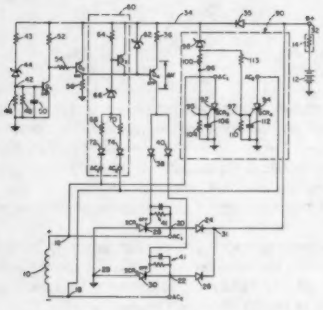
PROTECTION SYSTEM FOR SERIES REGULATOR

L. J. K. van Opijnen, Needham, Mass., assignor to Tympanium Corporation, Woburn, Mass.

Filed Jan. 12, 1981, Ser. No. 224,654

Int. Cl.³ H02J *7/10*; H02P *9/00*; H02H *3/28*

U.S. Cl. 320—59 **8 Claims**



1. A regulator circuit adapted to be connected between the output terminals of a power source which provides an A.C. signal at its output terminals to the terminals of a battery comprising:

rectifying means interposed between the terminals of said power source and said battery, said rectifying means having switching elements adapted when opened to interrupt the circuit between the terminals of the power source and battery;

means including a control transistor for opening said switching elements responsive to a predetermined battery charge; and

means connected to the terminals of said power source and responsive to the output voltage of said power source relative to the battery voltage for clamping said control transistor off during enough of the AC duty cycle to reduce the energy through said control transistor to a level below which forward bias second breakdown occurs, said rectifying means including a diode bridge circuit having a first pair of opposite points connected across the terminals of said power source and a second pair of opposite points coupled across the terminals of said battery, said switching elements including silicon controlled rectifiers having control terminals coupled to a first electrode of said control transistor and to different ones of said first pair of points, a second electrode of said control transistor being connected to a first one of said battery terminals, said clamping means including means for clamping the control electrode of said control transistor to said first one of said battery terminals.

4,401,937

CONTROL DEVICE FOR BATTERY CHARGING AC GENERATOR

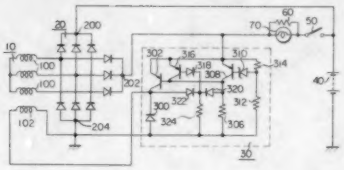
Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 954,176, Oct. 24, 1978, abandoned. This application Sep. 30, 1980, Ser. No. 192,594

Claims priority, application Japan, Nov. 2, 1977, 52/147876

Int. Cl.³ H02J *7/10*; H02P *9/10*

U.S. Cl. 322—28 **10 Claims**



1. A control device for controlling a battery charging AC generator including a field coil and having a full-wave rectifier means connected thereto for rectifying an AC output voltage from said AC generator and having a storage battery connected to said full-wave rectifier means for being charged therefrom;

said control device comprising:

a voltage regulating means connected to said battery and through said full-wave rectifying means to said AC generator for controlling said output from said AC generator to be below a predetermined magnitude, said voltage regulating means comprising: an output transistor serially connected to said field coil for causing a field current to flow therethrough for controlling said output voltage from said AC generator, a control transistor connected through said full-wave rectifying means to said AC generator and connected to said output transistor for controlling the conduction state of said output transistor, a diode-resistor network means connected to said field coil and connected to the collectors of said output transistor and said control transistor for providing an output when a high voltage above said predetermined magnitude occurs from an interlayer short-circuit in said field coil, and a current limiting transistor connected to said output transistor and said diode-resistor network means and said control transistor and having a base current supplied thereby by said output of said diode-resistor network means when the collector-to-emitter voltages of said output and control transistors reach said predetermined magnitude, wherein said current limiting transistor conducts, thereby causing said output transistor to not conduct.

4,401,938

VARIABLE-SPEED DRIVE FOR CONTROL OF INDUCTION GENERATORS

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 29, 1980, Ser. No. 220,865

Int. Cl.³ F02N *11/00*; H02P *9/06, 9/46, 15/00*

U.S. Cl. 322—29 **20 Claims**

1. A power generating system comprising:

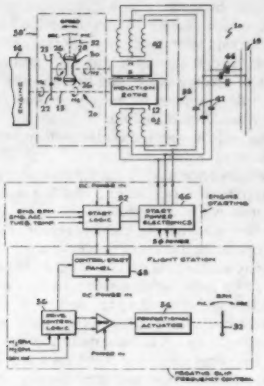
an induction machine including an induction rotor and a stator;

mechanical drive means connected to said induction motor for driving said induction machine at a variable speed;

a synchronous excitation generator coupled mechanically with said induction machine by means of a variable-speed drive, whereby said synchronous excitation generator will provide a variable output voltage and frequency;

means for applying said variable output voltage and frequency to said stator of said induction machine; and

drive-logic control means for monitoring the speed and load data of said induction machine and for adjusting and



maintaining the speed of said synchronous excitation generator so as to control the negative slip-frequency of said induction machine whereby said induction machine may operate in a generating mode with its output controlled in response to said speed and load data.

4,401,939

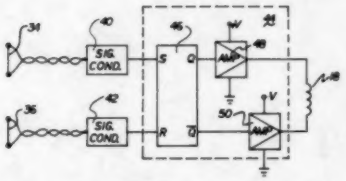
ALTERNATOR HAVING STATOR CARRYING BOTH FIELD AND ARMATURE WINDINGS

George K. Korbell, Euclid, Ohio, assignor to Sheller-Globe Corporation, Cleveland, Ohio

Filed May 1, 1981, Ser. No. 259,514

Int. Cl.³ H02K *3/00, 11/00;* **H02P** *9/46*

U.S. Cl. 322—59 **13 Claims**



1. An alternator comprising:

a stator;

a rotor mounted for rotation within said stator, said rotor being adapted to be mechanically driven so as to rotate;

said rotor and stator respectively having rotor and field poles formed at regularly spaced angular locations on facing surfaces thereof such that, as said rotor is rotated, the rotor poles on the rotor rotate past the field poles on the stator, said rotor poles being spaced about the rotor such that at certain rotational positions all rotor poles are opposed to alternate field poles;

field coils, each wound about a corresponding one of said field poles;

means for applying an excitation potential to said field coils such that field coils wound about adjacent field poles produce oppositely directed magnetic fields, whereby as said rotor rotates said rotor poles alternately complete and break magnetic field paths between adjacent field poles; and

armature coils each wound about at least at least a portion of a corresponding one of said field poles for providing induced voltages as a result of said completing and breaking of said magnetic field paths.

4,401,940

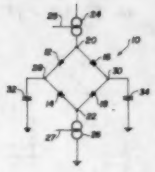
VOLTAGE EQUALIZER BRIDGE

Robert S. Pospisil, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 30, 1982, Ser. No. 431,229

Int. Cl.³ H03F *1/30*

U.S. Cl. 323—365 **10 Claims**



1. A voltage equalizer for a pair of capacitors comprising:

a diode bridge having first and second opposed power terminals and first and second opposed load terminals;

a first pair of opposed diodes of said bridge being forward-biased and a second pair of opposed diodes being reverse-biased when the voltage at said first load terminal is less than the voltage at said second load terminal and power is applied to said power terminals to charge and discharge capacitors at said first and second load terminals, respectively, until their voltages are equal; and

said first pair of opposed diodes being reverse-biased and said second pair of opposed diodes being forward-biased when the voltage at said first load terminal is greater than the voltage at said second load terminal and power is applied to said power terminals to discharge and charge capacitors at said first and second terminals, respectively, until their voltages are equal.

4,401,941

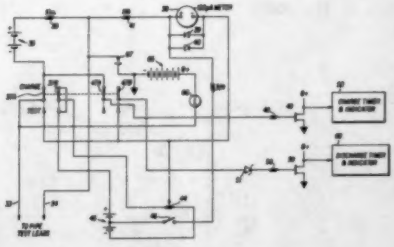
FLANGE AND CASING CHECKING INSTRUMENT

William E. Cunningham, Rte. 3, Seymour, Mo. 65746, and Orvin D. Simpson, Springfield, Mo., assignors to William E. Cunningham

Filed Dec. 4, 1981, Ser. No. 327,679

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—54 **10 Claims**



1. An insulation testing apparatus, comprising:

means for applying a direct current electrical potential to electrical conductors separated by an electrical insulator to be tested, said direct current electrical potential being of opposite polarity on opposite sides of said insulator;

means for interrupting said application of said direct current electrical potential; and means for measuring residual

electrical charge differential between said electrical conductors after interruption of said application of direct current electrical potential.

4,401,942

MONITORING SYSTEM FOR A CAPACITOR BATTERY IN AN AC VOLTAGE NETWORK

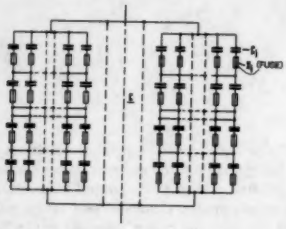
Klaus Renz, Fürth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,453

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020128

Int. Cl.³ G01R *11/52*

U.S. Cl. 324—60 C **1 Claim**



1. A monitoring system for a capacitor battery in an AC voltage network, the capacitor battery being of the type having a plurality of parallel legs, each such leg having a plurality of series-connected sectional capacitors with fuses, adjacent ones of the sectional capacitors being connected by continuous cross lines, the monitoring system comprising:

electronic simulator means for producing a signal corresponding to a fundamental frequency component of a simulated capacitor voltage; and

transient comparator means for comparing said fundamental frequency component of said simulated compacitor voltage with a fundamental frequency component of a measured capacitor voltage.

4,401,943

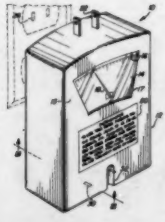
ELECTRICAL EFFICIENCY METER

Donald G. Morris, Tucson, Ariz., assignor to Betty Ann Garrett, Camdenton, Mo.

Continuation of Ser. No. 588,288, Jun. 19, 1975, abandoned. This application Nov. 17, 1978, Ser. No. 961,658

Int. Cl.³ G01R *1/08, 15/08*

U.S. Cl. 324—157 **2 Claims**



1. An apparatus for determining the cost of operation of an electrical device in a pre-determined unit of time when connected to a power source having pre-determined voltage and at relatively constant current during said period of time, said apparatus comprising:

(a) an instrument case having a front and including male plug associated therewith for connection to a power source and a female socket associated therewith for connection to the device to be tested;

(b) an ammeter circuit within said case for measuring current, said ammeter circuit being operatively connected to said plug and said socket whereby said ammeter circuit is interposed between a power source having pre-determined voltage and the electrical device being checked;

(c) a dial on said instrument case operably connected to said ammeter circuit having a dial scale calibrated to give a numerical reading correlated to measured current; and

(d) slide rule computation means on said instrument case adjacent said dial including:

(i) a first scale having indicia thereon corresponding to the calibration of said dial;

(ii) a second scale having indicia representative of various costs of power, said second and first scales being moveable relative to one another;

(iii) a third scale having indicia thereon representing various operational costs of power in a pre-determined unit of time, said indicia on said third scale being the mathematical product of combinations of various indicia on said first and second scales; and

(iv) indicator means cooperative with said third scale whereby the user can compute the operational cost of the electrical device in a selected unit of time at predetermined voltage and substantially constant current during said period by aligning the reading obtained on the dial of said instrument means on said first scale with applicable energy cost on said second scale and thereafter determining the operational cost by reading the cost on said third scale at said indicator means.

4,401,944

DISPLACEMENT DETECTOR HAVING FIRST AND SECOND MAGNETORESISTIVE ELEMENTS WITH A BIAS FIELD AT 45° TO EACH ELEMENT

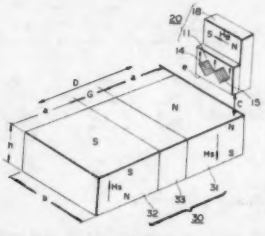
Akihisa Narimatsu, Naka, and Hiroyuki Ohkubo, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,115

Claims priority, application Japan, Feb. 22, 1980, 55-21112; Mar. 3, 1980, 55-25268

Int. Cl.³ G01B *7/14;* **G01R** *33/02;* **G01L** *43/08*

U.S. Cl. 324—207 **39 Claims**



1. In magnetic field sensing apparatus comprising:

magnetic sensing means including first and second magnetoresistive elements having respective, substantially planar, current path portions disposed at a predetermined angle with respect to each other and through which current flows in correspondingly respective current flow directions, means for supplying a bias current to flow through said respective current path portions, and bias field means for supplying a bias magnetic field in the plane of said respective current path portions; and

external field generating means for supplying a magnetic signal field in said plane of said respective current path portions, said external field generating means and said magnetic sensing means being relatively displaceable with respect to each other;

the improvement wherein said bias magnetic field is supplied at an angle of approximately 45° with respect to each of said current flow directions, and wherein said external field generating means comprises magnetizing means for generating said magnetic signal field of a first polarity that gradually decreases and changes over at a boundary region to an opposite polarity that gradually increases, all in the direction of relative displacement, said gradually changing magnetic signal field being detected by said magnetic sensing means to produce an output signal that varies substantially linearly with said displacement over a predetermined range of displacement on both sides of said boundary region.

4,401,945

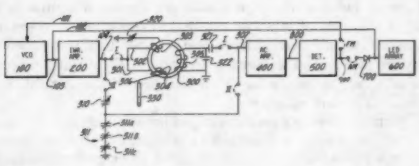
APPARATUS FOR DETECTING THE POSITION OF A PROBE RELATIVE TO A WORKPIECE

Richard O. Juengel, Romeo, Mich., assignor to The Valeron Corporation, Troy, Mich.

Filed Apr. 30, 1981, Ser. No. 259,257

Int. Cl.³ G01B 7/14; G08B 23/00; G05D 00/00

U.S. Cl. 324—207 **19 Claims**



13. Apparatus for detecting probe contact with a workpiece comprising:

a probe contact surface;

oscillator means operative to generate an alternating current signal at an output thereof;

amplifier means having an input coupled to the oscillator means output, operative to provide an excitation signal proportional to the alternating current signal at an output of the amplifier means;

transducer means coupled between the probe contact surface and the amplifier means output, operative to alter the excitation signal whenever the probe contact surface contacts the workpiece and to present a signal proportional to the probe excitation signal at a transducer means output;

detector means coupled for receipt of the proportional signal presented by the transducer means output and operative to generate an indicator signal at a detector means output whenever the proportional signal is received;

a source of infrared radiation having a control input coupled to the oscillator means output, the source operative to emit infrared radiation at an amplitude and frequency related to that of the alternating current signal received at the control input; and

means coupled between the detector means output and the control input for altering a predetermined characteristic of the alternating current signal whenever the indicator signal is generated by the detector means, whereby infrared radiation having a predetermined characteristic is transmitted by the source whenever the indicator signal is generated.

4,401,946

PISTON POSITION DETECTOR HAVING A METAL CYLINDER ROTATING ABOUT AN ECCENTRIC AXIS

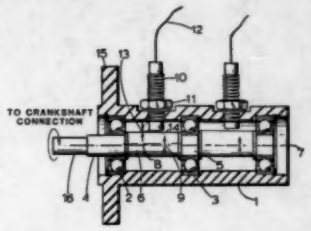
Jacob Klimstra, Buitenpost, Netherlands, assignor to N.V. Nederlandse Gasunie, Groninger, Netherlands

Filed Sep. 12, 1980, Ser. No. 186,597

Claims priority, application Netherlands, Sep. 12, 1979, 7906791

Int. Cl.³ G01B 7/14; G01P 3/54

U.S. Cl. 324—208 **6 Claims**



1. Device for generating an electrical signal whose magnitude varies in substantially linear relation to the distance at which a piston in a piston machine is from its top dead centre, which device is provided with a rotatable part having a circular circumference which can rotate with the crank shaft of the piston machine about an axis of rotation eccentric to said circular circumference, characterized in that the said rotatable part is a cylindrical metal part having its cylinder axis parallel to but eccentrically offset from its axis of rotation, with the ratio of eccentricity to cylinder radius being substantially equal to the ratio of crank length to connecting-rod length in the piston machine and with an eddy-current distance meter being provided for determining, without resort to contact, the distance between a fixed point and the surface of the said cylindrical metal part, measured along the line from the said fixed point normal to the axis of rotation, this fixed point being in such a position that the said distance has a predetermined value, said predetermined value being at a maximum or a minimum when said piston is in its top dead centre position.

4,401,947

SMALL HOLE WELL LOGGING SONDE AND SYSTEM WITH TRANSMITTER AND RECEIVER ASSEMBLIES

Percy T. Cox, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,095

Int. Cl.³ G01V 3/28

U.S. Cl. 324—338 **22 Claims**

1. A well logging sonde having an outer diameter of 1-11/16 inches or less, comprising

a transmitter coil,

at least two receiver coils,

coil housing means having an outer surface for housing all the coils in a predetermined spatial relationship to each other,

transmitter means electrically connected to the transmitter coil for providing a signal to energize the transmitter coil in the coil housing means to develop an electromagnetic field in an earth formation,

transmitter case means having an outer surface and mechanically connected to the coil housing means for housing the transmitter means,

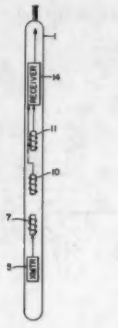
receiver means electrically connected to the receiver coils for receiving signals from the receiver coils resulting from reception of electromagnetic energy from the electromagnetic field after passage through the earth formation and for providing a signal representative of at least one char-

acteristic of the earth formation in accordance with the signals from the receiver coils,

receiver case means having an outer surface and mechanically connected to the coil housing means for housing the receiver means, and

cable connector means having an outer surface and mechanically connected to the receiver case means and to a well logging cable for providing the signal from the receiver means to the well logging cable; and

in which the outer surfaces of the coil housing means, the transmitter case means, the receiver case means and the cable connector means comprise the outer surface of the well logging sonde.



4,401,948

DIAGNOSTIC APPARATUS FOR INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

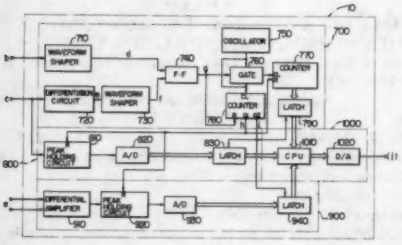
Kazuhiko Miura, Okazaki; Takakazu Kawabata, Toyota; Tadashi Hattori, Okazaki, and Yoshiki Ueno, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 8, 1981, Ser. No. 300,297

Claims priority, application Japan, Sep. 11, 1980, 55-126339

Int. Cl.³ F02P *17/00*

U.S. Cl. 324—378 **5 Claims**



1. A diagnostic apparatus for an internal combustion engine ignition system comprising:

a secondary voltage rising gradient measuring circuit for measuring the gradient of rise of a secondary voltage generated by the secondary of an ignition coil;

a primary breaking current measuring circuit for measuring a primary current when the conduction of current through the primary of said ignition coil is interrupted; and

an arithmetic circuit for computing the value of stray capacitance existing in the ignition system and the value of secondary generation voltage, from information representative of the gradient measured by said secondary voltage rising gradient measuring circuit and from the value of the primary breaking current measured by said primary breaking current measuring circuit, said arithmetic circuit delivering out the stray capacitance and secondary generation voltage values.

4,401,949

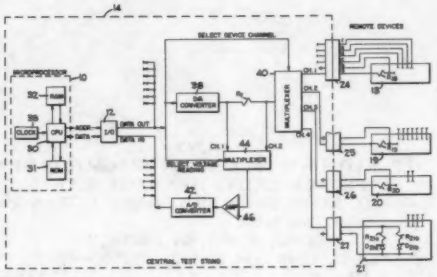
EXTERNAL DEVICE IDENTIFICATION SYSTEM

Kenneth S. Gold, Canoga Park, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 2, 1981, Ser. No. 230,192

Int. Cl.³ F02P *17/00*

U.S. Cl. 324—402 **5 Claims**



1. In an automobile engine analyzer having a central test stand, a plurality of types of external devices, and a common connector on said central test stand adapted to singly receive all types of external devices, a system for identifying which type of external device has been attached to the central test stand, said system comprising:

an element having a predetermined impedance value electrically accessible within each external device, the particular impedance value being the same for all external devices of a particular type and being different for different particular types;

means located on the central test stand for selective electrical connection with and evaluation of the impedance value within the particular type of external device which is connected to the central test stand through the common connector at any given time; and

means for determining which particular type of device has been connected to the central test stand based on the value of impedance so determined.

4,401,950

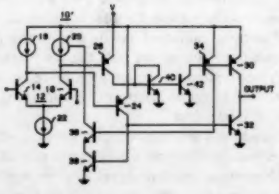
LOW-VOLTAGE, COMPLEMENTARY SYMMETRY CLASS B AMPLIFIER ARRANGEMENT

Darrell E. Davis, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1980, Ser. No. 213,285

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—255 **11 Claims**



1. A low-voltage, complementary symmetry amplifier driver, comprising in combination:

a differential amplifier with first and second transistors, each

having a current source coupled to a respective output collector electrode with common connected emitter electrodes being coupled to a reference potential through a third current source,

said current sources coupled to said first and second transistors being unbalanced in current with respect to each other and collectively at least equal to the current in said third current source; and

third and fourth transistors each having an output electrode and an input electrode connected to a respective output electrode of said first and second transistors of said differential amplifier,

said third and fourth transistors being of the complementary type to said first and second transistors.

4,401,951
BIAS CIRCUIT FOR USE IN A SINGLE-ENDED PUSH-PULL CIRCUIT

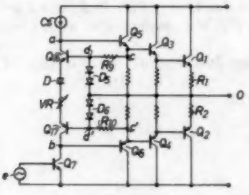
Susumu Tanaka, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,405

Claims priority, application Japan, Oct. 2, 1979, 54-136386[U]

Int. Cl.³ H03F 3/30

U.S. Cl. 330—268 **8 Claims**



7. A bias circuit for use in a single-ended push-pull circuit which includes NPN and PNP transistors connected in plural stages in Darlington manner, comprising

a first transistor of NPN type having its collector connected to the base of a first stage NPN transistor,

a second transistor of PNP type having its collector connected to the base of a first stage PNP transistor and its emitter connected to the emitter of said first transistor,

a first resistance element connecting the base of said first transistor with the emitter of one of NPN transistors except that on the output stage in the push-pull circuit,

a first means for producing a constant voltage connected between the base of said first transistor and the output point of said push-pull circuit,

a second resistance element connecting the base of said second transistor with the emitter of one of PNP transistors except that on the output stage in the push-pull circuit, and

a second means for producing a constant voltage connected between the base of said second transistor and the output point of said push-pull circuit.

4,401,952
MICROWAVE SWITCHED AMPLIFIER/MULTIPLIER

Ganesh R. Basawapatna, Santa Rosa, Calif., assignor to Microsource, Inc., Santa Rosa, Calif.

Filed Jul. 20, 1981, Ser. No. 285,211

Int. Cl.³ H03F 3/16, 3/60

U.S. Cl. 330—277 **9 Claims**

1. A microwave signal amplifying and multiplying apparatus capable of substantially continuous tuning over a first frequency range which is greater than a first tunable frequency range of a continuously tunable microwave frequency oscillator, said apparatus comprising:

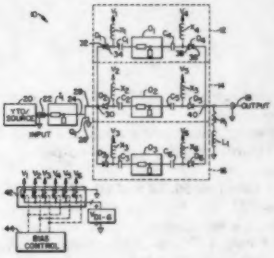
input matching means for coupling to a single microwave frequency oscillator;

a solid-state microwave frequency amplifying element having a first gate electrode, a drain electrode and a source electrode, said amplifying element being operable at a first bias level over said first microwave frequency range as a signal amplifier and at least a second bias level as a signal amplifier and multiplier over harmonics of said first frequency range;

a plurality of signal channel means, each signal channel means having a signal input terminal coupled to a signal output terminal in common with other signal channel means, each said signal channel means comprising:

(a) a first diode having a first electrode and a second electrode, said first electrode being DC coupled to said drain electrode through said input terminal and said second electrode being DC coupled to a bias terminal;

(b) a microwave frequency output matching network coupled to receive microwave signals through said first diode, said matching network being specific to a selected range



of frequency different from ranges of frequency of other ones of said signal channel means; and

(c) a second diode coupled to receive microwave signals through said output matching network and having a first electrode and a second electrode, said first electrode thereof being coupled to said common output terminal and said second electrode thereof being DC coupled to a bias means;

first bias means for selectively forward and reverse biasing each one of said first diodes;

second bias means for selectively forward and reverse biasing each one of said second diodes;

said amplifying element being coupled in a common source configuration with said source electrode coupled to ground and wherein said first bias means is operative to provide forward bias to said first diode and to preselect a desired operating region of said amplifying element, said first and second bias means being switchable in concert to couple and uncouple said amplifying element through a selected one of said plurality of signal channel means to said common output.

4,401,953
HIGH STABILITY AMPLIFIER

William A. Adams, College Park, and Victor S. Reinhardt, Gaithersburg, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 17, 1981, Ser. No. 284,290

Int. Cl.³ H03F 3/04

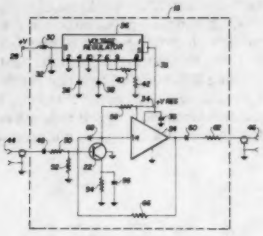
U.S. Cl. 330—289 **16 Claims**

1. A low noise, wideband radio frequency signal amplifier for providing increased radio frequency isolation and signal stability for changes in ambient temperature between input and output circuit means comprising:

voltage regulator means (26) for regulating a power supply potential applied thereto and providing radio frequency

isolation from cross-talk appearing at a source supplying said power supply potential, said regulator means including active circuit means and package means (77) for said active circuit means;

electrical signal amplifier means including first and second signal amplifiers (22, 24) connected in a feedback circuit configuration including at least one feedback circuit element (66) and wherein said first amplifier (22) comprises a gain producing circuit and said second amplifier (24) comprises a unit gain isolation circuit, each amplifier (22, 24) additionally having respective active circuit means



and package means (73, 75) for said respective active circuit means;

said regulator means being coupled to said amplifier means (22, 24) for applying a regulated power supply potential thereto;

circuit means (48, 50, 52 and 60, 62) coupling said amplifier means (22, 24) between said input and output circuit means (44, 46); and

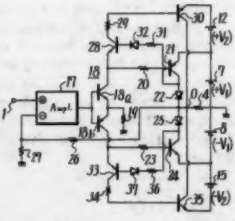
heat sink means (70) in common thermal contact with said package means (73, 75, 77) for providing a common temperature reference for said active circuit means.

4,401,954

POWER AMPLIFIER

Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,507
Claims priority, application Japan, Aug. 14, 1980, 55-112015
Int. Cl.³ H03F *3/26*
U.S. Cl. 330—297 **9 Claims**



1. A power amplifier comprising:

(a) first and second positive DC voltage terminals, the DC voltage at said first positive DC voltage terminal being lower than that at said second positive DC voltage terminal;

(b) first and second negative DC voltage terminals, the DC voltage at said first negtive DC voltage terminal being lower than that at said second negative DC voltage terminal;

(c) signal input means producing a pair of input signals with opposite phase relation at first and second output terminals;

(d) first and second output transistors having input electrodes connected to the first and second output terminals of said signal input means, respectively, the main current paths of which are connected in series between said first positive and negative DC voltage terminals, the connection point of said first and second output transistors being a signal output terminal to be connected with a load;

(e) third and fourth output transistors each having an input electrode, the main current paths of which are connected in series between said second positive and negative DC voltage terminals, the connection point of said third and fourth output transistors being connected to said signal output terminal;

(f) a first switching transistor having a control electrode connected to said signal output terminal, the main current path of which is connected between the input electrode of said third transistor and the first output terminal of said signal input means; and

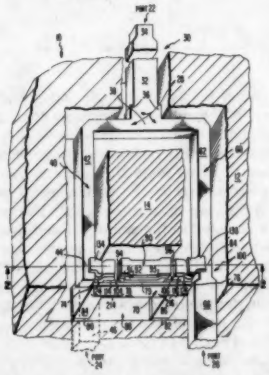
(g) a second switching transistor having a control electrode connected to said signal output terminal, the main current path of which is connected between the input electrode of said fourth transistor and the second output terminal of said signal input means.

4,401,955

BROADBAND, HIGH POWER, COAXIAL TRANSMISSION LINE COUPLING STRUCTURE

Leonard H. Yorinks, Cherry Hill, N.J., and Curtis E. Milton, Jr., Cockeysville, Md., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,604
Int. Cl.³ H01P *5/12*
U.S. Cl. 333—127 **6 Claims**



1. A coaxial transmission line coupling structure for coupling a common port to first and second branch ports, said structure designed for operation over a predetermined frequency band, said structure comprising:

an inner conductor system including a common leg and first and second branch legs, said branch legs joined to said common leg and each other at a common junction;

an outer conductor spaced from, and coaxially enclosing, said inner conductor system;

a heat conductive, dielectric body disposed adjacent said inner conductor branch legs, said body making thermally conducting contact to said outer conductor;

an odd mode power dissipation element comprising a series compensating capacitor-resistor-compensating capacitor circuit connected between said branch legs with its connection to each branch leg substantially ¼ transmission line wavelength along that branch leg from said common junction at a frequency within said band;

said resistor disposed in thermally conducting contact with

said heat conductive dielectric body, said odd mode power dissipation element having inductance associated with it, said compensating capacitors series resonating said inductance to present relatively low reactances in series between said first and second branch legs and said resistor at frequencies in said band;

said dielectric body contributing to parasitic capacitances between said odd mode power dissipation element and said outer conductor; and

reactive compensation means for minimizing the adverse effects of said parasitic capacitances at frequencies within said band.

4,401,956

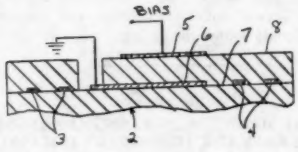
ELECTRONICALLY VARIABLE TIME DELAY IN PIEZOELECTRIC MEDIA

Shrinivas G. Joshi, 4344 Regal Ct., New Berlin, Wis. 53151

Filed Sep. 14, 1981, Ser. No. 302,222

Int. Cl.³ H01P *9/42, 9/38, 9/68*

U.S. Cl. 333—152 **2 Claims**



1. A variable delay line for surface acoustic waves, comprising:

a piezoelectric substrate having a wave-propagating surface;

input and output transducer means affixed in spaced relation on said wave-propagating surface for sending and receiving surface acoustic waves on said surface;

electrode means for connection to a source of variable voltage for producing a biasing electric field in said substrate to cause a strain in said substrate to vary the time delay of said waves, said time delay changeable proportionately in response to varying applied voltages, said electrode means includes a first electrode in the form of a grating positioned on said wave-propagating surface, a non-piezoelectric thin film deposited on said wave-propagating surface over said first electrode, and said electrode means further includes a second electrode positioned on said thin film.

4,401,957

PERMUTATING ANALOG SHIFT REGISTER VARIABLE DELAY SYSTEM

Ronald E. McKeighen, Hoffman Estates, Ill., and Michael P. Buchin, Palo Alto, Calif., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Division of Ser. No. 50,002, Jun. 8, 1979, Pat. No. 4,267,584, which is a continuation-in-part of Ser. No. 812,109, Jul. 1, 1977, Pat. No. 4,173,007. This application Feb. 2, 1981, Ser. No. 230,323

Int. Cl.³ H03H *17/08;* **G11C** *19/28*

U.S. Cl. 333—165 **1 Claim**

1. Variable delay analog signal means comprising:

a plurality of analog shift register memories;

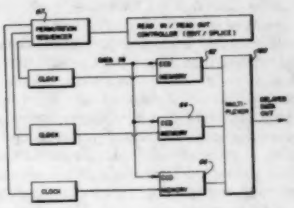
a source of clock signals;

a source of to-be-delayed signal, coupled to each of said memories;

commutating write means, coupled to said source of clock signals, and said plurality of memories, for applying to each of said memories in a predetermined repetative sequence a succession of shift signals causing said memories to turn to be serially filled with portions of said to-be delayed signal;

commutating read means, coupled to said source of clock signals and said plurality of memories, for applying a succession of shift signals to said memories to retrieve therefrom said portions of said to-be delayed signal stored therein, said commutating read means being operative so that such retrieving operation is independent of but follows by a time interval said filling operation of said commutating write means in said predetermined repetative sequence; and

edit/splice means for altering the time interval between said data retrieval and said filling operation to produce dynamic variation of delay.



4,401,958

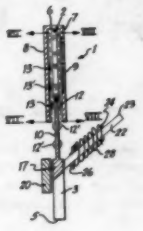
ELECTROMAGNETIC TRIGGER SWITCH

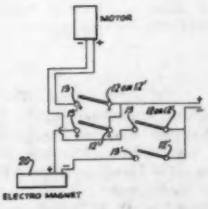
Kenneth C. Noorigian, 1700 Tilton's Corner Rd., Wall Township, Monmouth County, N.J. 07719

Filed Oct. 5, 1981, Ser. No. 308,460

Int. Cl.³ H01H *9/20, 45/00*

U.S. Cl. 335—170 **10 Claims**





1. Apparatus for controlling the operation of electrically operated equipment comprising circuit connection means comprising first and second spaced terminals, said first terminal adapted for interconnection with a source of electricity and said second terminal adapted for interconnection with said electrically operated equipment, whereby said electricity can be supplied to said electrically operated equipment by electrically connecting said spaced terminals, interconnection means including conductor means, said interconnection means being movable along a first predetermined path between a first position in which said conductor means is not in electrical contact

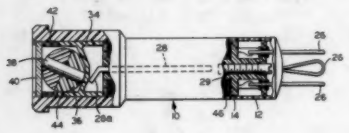
with said first and second spaced terminals, and a second position in which said conductor means is in electrical contact with said first and second spaced terminals to thereby supply electricity to said electrically operated equipment from said source of electricity, locking means movable along a second predetermined path between a first position in which said locking means crosses said first predetermined path, so that when said interconnection means is in said second position, said locking means prevents said interconnection means from moving along said first predetermined path back to said first position, and a second position in which said locking means does not cross said first predetermined path, so that when said interconnection means is in said first position at least a portion of said interconnection means is located in said second predetermined path so as to prevent said locking means from being moved along said second predetermined path from said second position into said first position, said locking means comprising a metal, and electromagnet means located along said second predetermined path for retaining said locking means in said first position upon the activation of said electromagnet means.

4,401,959

MAGNETICALLY ACTUATED INDICATOR

John A. Enright, Orange; Milton N. Ives, Wolcott, and Richard H. Daniels, Woodbury, all of Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,362
Int. Cl.³ H01F 7/08
U.S. Cl. 335—272 **8 Claims**



1. A magnetically actuated indicator which comprises:
a body member;
a magnetic core having an elongated body having an axis, and a first asymetric axial extremity, means for mounting said core in said body member to allow (a) sliding movement and (b) rotation about the axis of said elongated body thereof;
at least one elongated winding disposed for cooperation with said core; and
at least one indicator member having at least first and second discrete magnetic poles disposed in spaced relationship from each other, said member being mounted for magnetic cooperation with said extremity.

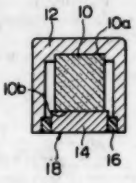
4,401,960

MAGNET ASSEMBLY

Mamoru Uchikune; Mutsukazu Tagami, both of Ueda; Taketo Shimizu, Nagano; Kiyoshi Yanagisawa, Ueda; Katsuto Yokosawa, Nagano; Kunio Horiuchi, and Hiroo Sakaguchi, both of Ueda, all of Japan, assignors to Kanetsu Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Dec. 18, 1979, Ser. No. 104,720
Int. Cl.³ H01F 7/20
U.S. Cl. 335—285 **7 Claims**

1. A magnet assembly comprising:
a cylindrical casing made of a magnetic material, opened at one end and closed at the other end;
a core disposed within said casing and positioned to define a spacing between the inner surface of the casing and the exterior peripheral surface of the core, an end surface of the core being coplanar with the open end surface of the casing to form a magnetic attraction surface;
a permanent magnet disposed within said spacing between said core and said casing, said magnet having one magnetic pole on the exterior surface opposite the inner surface of said casing and the other magnetic pole on the inner surface opposite the exterior peripheral surface of said core;



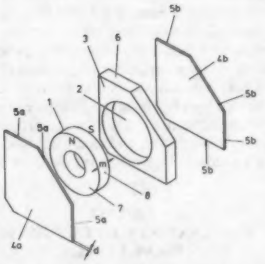
a gap provided between the closed end of said casing and the adjacent end surfaces of said core and said permanent magnet; and
a spacer disposed within said gap and contacting the opposed surfaces of said casing and said core to maintain the core stationary within the casing.

4,401,961

PERMANENT MAGNETIC HOLDING ARRANGEMENT, PARTICULARLY FOR TEMPORARY HOLDING OF FERRO-MAGNETIC PARTS

Horst Baermann, Rösrath, and Otmar Dibos, Lohmar, both of Fed. Rep. of Germany, assignors to Rheinmagnet Horst Baermann KG, Neukirchen, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 312,261
Int. Cl.³ H01F 7/20
U.S. Cl. 335—285 **16 Claims**



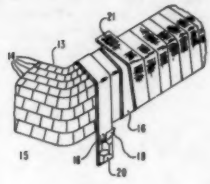
1. A permanent magnetic holding arrangement, particularly for temporary and accurately angled holding of ferro-magnetic work pieces, e.g. for connection by welding, comprising at least one permanent magnet having flat pole faces facing oppositely away from each other and said magnet being magnetized through its smallest thickness between its said pole faces, and at least two pole plates of high magnetic permeability and like thickness abutting flatwise against respective ones of the said magnetized pole faces of the permanent magnet(s), the peripheral edges of said pole plates extending beyond the permanent magnet and forming the magnetized holding surfaces of the holding arrangement of differing polarity, the said pole plates each having several adjoining portions of their said holding edge surfaces correspondingly arranged on the respective pole plates at various large angles to each other, and the thickness of the said pole plates being so selected, relative to the magnetic permeability thereof and the magnetic strength of said permanent magnet(s), as to produce a magnetic oversaturation of the said pole plates through the inducing effect of the said permanent magnet(s).

4,401,962

FLEXIBLE THERMALLY STABLE TAPES CONTAINING A HIGH FLASH POINT SOLVENTLESS INSULATING VARNISH

Wei-Fang A. Su, Churchill Borough, and Frank A. Sattler, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 2, 1982, Ser. No. 438,425
Int. Cl.³ H01F 27/30
U.S. Cl. 336—205 22 Claims



1. A tape impregnated with a cured impregnating composition comprising a blend of:

(A) an alkyd component consisting essentially of the reaction product of:

(i) polyhydric alcohol comprising polyhydric triol alcohol,

(ii) at least 29 equivalent % of the alkyd component of fatty acid, and

(iii) organic dibasic acid, and

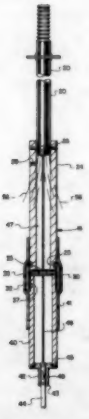
(B) an alkyl acrylate monomer; said tape characterized as being flexible and being capable of being wrapped around an electrical conductor without cracking.

4,401,963

RESISTOR INSERTION FUSE

Clarence G. Duenke, Marthasville, Mo., assignor to Warco, Inc., Marthasville, Mo.

Filed Dec. 14, 1981, Ser. No. 330,251
Int. Cl.³ H01H 85/42
U.S. Cl. 337—282 15 Claims



1. A fuse for use in a relatively high voltage circuit comprising:

a first conductor element comprising a terminal at one end of said fuse;

a second conductor element comprising a terminal at the opposite end of said fuse;

an elongated rupturable fuse element interconnecting said first and second conductor elements;

a gas generating member disposed around at least a portion of said fuse element;

an arc intercepting member disposed around said fuse element between said conductor elements; and

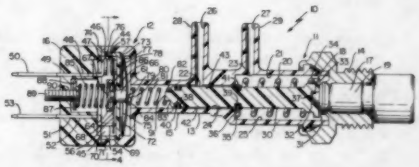
a resistor element connected to said intercepting member in electrically conductive relationship thereto for reducing the value of an arc generating fault current sufficiently, upon rupture of said fuse element, so that said arc is extinguishable by deionizing gas generated by said gas generating member.

4,401,964

COMBINED TEMPERATURE RESPONSIVE VALVE CONSTRUCTION AND ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Frank Payne, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 15, 1981, Ser. No. 254,378
Int. Cl.³ H01H 37/74
U.S. Cl. 337—343 24 Claims



1. In a combined temperature responsive valve construction and an electrical switch construction wherein said valve construction has a thermally responsive device of the piston and cylinder type operating a movable valve member that is engaged by said piston of said device and that operates an actuator of said switch construction, said valve member comprising an axially movable valve stem having opposed ends one of which is engaged by said piston of said device and the other of which operates said actuator, the improvement wherein said other end of said valve stem has spring retaining means, and a coiled compression spring having opposed ends one of which engages in a retained manner said spring retaining means of said other end of said valve stem and the other of which engages said actuator whereby axial movement of said valve stem toward said actuator will tend to compress said spring therebetween.

4,401,965

THERMAL SWITCH

Sven Backlund, Shoreview, and Forrest R. Grimm, Golden Valley, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 12, 1982, Ser. No. 367,380
Int. Cl.³ H01H 37/76
U.S. Cl. 337—408 3 Claims

1. A thermal switch comprising:

a tubular, electrically and thermally conductive metal casing,

a first electrically conductive lead joined to and extending from one end of said metal casing to seal off said one end and make electrical connection to said casing,

an insulative ceramic bushing at the opposite end of said casing, said bushing sealing the opposite end of said casing and having its bore coaxial with said casing,

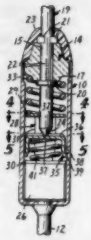
a second electrically conductive lead extending into said

casing through the bore of said ceramic bushing and out of said casing to permit electrical connection thereto,

a normally solid, fusible pellet within said casing adjacent said one end,

a mechanical isolation cage within said casing having first and second parallel ends perpendicular to the axis of said casing, said cage being axially slidable within said casing and having a central opening in its first end adjacent said opposite end of said casing through which said second lead normally freely passes,

a first helical compression spring between said ceramic bushing and said first end of said cage urging said cage against said fusible pellet,



an electrically conductive contact member extending through said cage in a direction perpendicular to the axis of said casing and having its ends terminating in close proximity to the side walls of said casing, said contact member being foldable along a line across its center and having a portion to each side of its center that has a component perpendicular to the axis of said casing and a component parallel to the axis of said casing, and

a second helical compression spring between said second end of said cage and contact member pressing said contact member against the end of said second lead to cause said contact member to fold until its ends contact the side wall of said casing.

4,401,966

MAGNETOELECTRIC TRANSDUCER AND FABRICATION METHOD THEREFOR

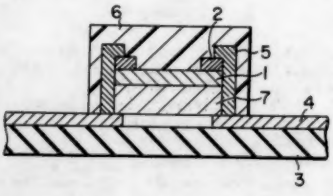
Kaoru Ohmura, Fuji; Masaru Matsuura, Kurashiki; Takeki Matsui, and Takeo Kimura, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 16, 1981, Ser. No. 274,115

Claims priority, application Japan, Jun. 18, 1980, 55-83364

Int. Cl.³ H01L *43/02*

U.S. Cl. 338—32 R **19 Claims**



1. A magnetoelectric transducer comprising:

a magnetosensitive thin layer;

lead connecting electrodes formed on and in part of the magnetosensitive thin layer;

an unwindowed film support carrying, on one side thereof, said electrodes and thin layer;

leads formed on the film support on the one side thereof;

conductive resin applied on the leads, for connecting said leads and said lead connecting electrodes; and

sealing mold resin applied on the one side of said film support, for molding said magnetosensitive thin layer, said lead connecting electrodes, portions of said leads, and said conductive resin, said mold resin connecting to said film support.

4,401,967

GAS SENSOR

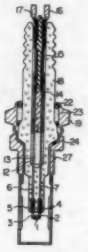
Naoto Miwa, Tsushima, and Yoshihiro Segawa, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 23, 1981, Ser. No. 286,345

Claims priority, application Japan, Jul. 30, 1980, 55-108262[U]; Jul. 31, 1980, 55-108729[U]

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—34 **17 Claims**



1. A gas sensor comprising a sintered metal oxide with the resistance value thereof changing according to the gas component, a gas sensor element including at least one electrode embedded in said sintered metal oxide, a ceramic insulator for insulatively holding said gas sensor element, means for securing at least one lead wire within said ceramic insulator, and a lead connection connected to the electrode of said gas sensor element and having a tubular portion supported in said insulator and connected to the lead wire.

4,401,968

MANUAL BELT ELECTRO-OPTICAL CONTROL

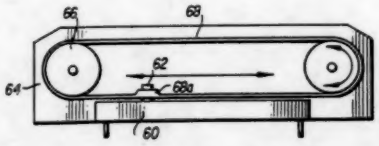
Richard H. Shellenberger, Asheville, N.C., assignor to SHS Research Labs Inc., Linwood, N.C.

Division of Ser. No. 65,349, Aug. 9, 1979, Pat. No. 4,271,354.

This application Dec. 31, 1980, Ser. No. 221,729

Int. Cl.³ H01C *10/38*

U.S. Cl. 338—176 **2 Claims**



1. A control for a linear motion variable resistor having a contact which is movable in a longitudinal direction, said control comprising:

an endless belt having first and second substantially planar runs, said first run being reversibly, intermittently and manually alone movable with a finger applied to the exterior of the first run to move the belt in an endless path, the exterior surface of said first planar run being a drive surface,

first and second guide means for holding said belt in an

extended position and guiding said belt in an endless path when said first run is manually moved,

said second run being disposed adjacent to a stationary resistor and having the contact secured to and permanently touching said second run so as to touch the resistor, whereby when the belt is moved manually the contact is moved longitudinally between said first and second guide means to vary the resistance of the resistor.

4,401,969

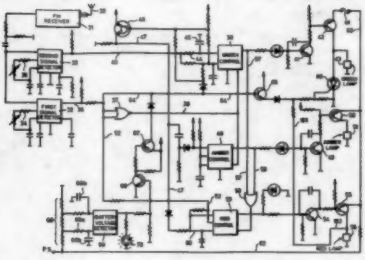
TRAFFIC CONTROL SYSTEM

Gordon J. Green, 386 Ruth Ave., Willowdale, Ontario, Canada (M2M 2J2), and Robert J. deBruyn, R.R. #4 Bloomington Side Rd., Stouffville, Ontario, Canada (L0H 1L0)

Continuation of Ser. No. 93,349, Nov. 13, 1979, abandoned. This application Oct. 8, 1981, Ser. No. 309,735

Int. Cl.³ G08G *1/00, 1/097;* G08B *21/00*

U.S. Cl. 340—41 R **24 Claims**



1. A traffic control system comprising:

(A) a transmitter unit including:

(1) circuit means for transmitting a carrier signal

(2) circuit means for selectively modulating the carrier signal with a first modulation signal at a first frequency, and

(3) circuit means for selectively modulating the carrier signal with a second modulation signal at a second frequency different from the first frequency, and

(B) a receiver unit for receiving the transmitted carrier signal and any modulation thereof by said first and second modulation signals and adapted to produce in response to receipt of the carrier signal modulated by both modulation signals and in cyclic sequence display of green, amber and red visual traffic signals, the receiver including:

(1) a first detector detecting the said first modulation signal and producing a corresponding first control signal,

(2) a second detector detecting the said second modulation signal and producing a corresponding second control signal, and

(3) receiver circuit means requiring receipt of both said first and second control signals, for longer than a predetermined period and responsive to such receipt to cause display of the green visual traffic signal,

(C) wherein the transmitter includes circuit means for generating a pulse of the said carrier modulated by said first and second modulation signals, which pulse is of a period shorter than the said predetermined period required for the said display of the green visual signal, and

wherein the receiver circuit means is responsive to receipt of both said first and second control signals for a period longer than the said pulse to cause the said display of the green visual signal, is responsive to cessation of receipt of at least one of said control signals to cause display of the amber visual signal, and is responsive to receipt of the said pulse to cause display of the amber visual signal without prior display of the green visual signal.

4,401,970

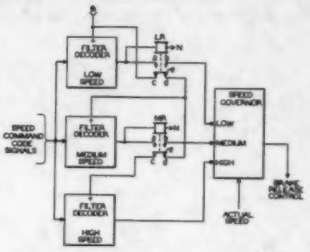
VITAL LOWEST SPEED COMMAND SELECTOR

John O. G. Darrow, Murrysville, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Jun. 12, 1981, Ser. No. 272,841

Int. Cl.³ B61L *3/00*

U.S. Cl. 340—47 **2 Claims**



1. In combination with a speed control system on a train which includes a speed governor operable for comparing an authorized speed command with the actual train speed to control train brakes accordingly and a plurality of speed command decoders, each responsive to a distinct received code signal only when supplied with operating energy for producing a different authorized speed command for application to said speed governor; vital lowest speed command selector apparatus comprising,

(a) a relay coupled to each decoder, except the highest speed command decoder, having separate first and second sets of contacts closed only when the relay occupies a first and a second position, respectively, each relay normally occupying its first position and responsive to an output command from the associated decoder for operating to its second position,

(b) a first circuit associated with each relay and controlled by the corresponding second contact set for applying the speed command output of the associated decoder to a corresponding input of said governor only when that relay operates to its second position, and

(c) a second circuit associated with each relay and controlled by the corresponding first contact set for normally supplying operating energy to all higher speed decoders and for interrupting such energy supply to inhibit any speed command output from those decoders when that relay operates to its second position,

(d) any relay operating fault which cross connects the corresponding first and second sets of contacts inhibiting all operation of said speed governor by application of operating energy thereto.

4,401,971

ALARM DEVICE FOR A VEHICLE INCLUDING PRIORITY CONTROL FOR PLURAL ALARM CONDITIONS

Tadashi Saito; Tohru Sampei; Akihiro Asada; Yoshihiro Ohta, all of Yokohama; Syunji Iwasaki, Gifu; Shigemitsu Higuchi, Yokohama; Hiroshi Ozawa, Katsuta, and Yasunari Tanaka, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,187

Claims priority, application Japan, Mar. 10, 1980, 55-30056; Mar. 28, 1980, 55-38848

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—52 F **6 Claims**

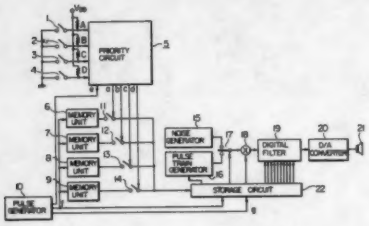
1. An alarm device for a vehicle, comprising:

a plurality of sensors each for detecting a different abnormal state of the vehicle to produce an abnormal state detection signal;

means for producing alarm speeches corresponding to said

abnormal states of the vehicle detected by said sensors; and

a logic circuit interposed between said plurality of sensors and said alarm speech producing means and responsive to a detection by any of said sensors to generate at least one alarm speech designation signal, said logic circuit including a priority circuit for receiving abnormal state detection signals produced by said sensors and determining the order of precedence of said received detection signals to



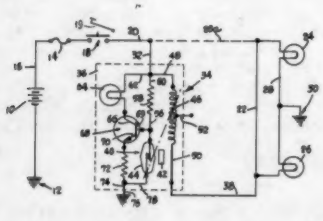
generate said at least one alarm speech designation signal in accordance with said determined order of precedence for application to said alarm speech producing means, in which said priority circuit includes means for determining said order of precedence and means for temporarily disabling said received detection signals sequentially in said order of precedence so that plural alarm designation signals are generated sequentially in said order of precedence and such generation of alarm designation signals are automatically repeated.

4,401,972

STOP-LIGHT MONITOR DEVICE

Peter J. Lupoli, Hamden, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,064
Int. Cl.³ B60Q *1/26*
U.S. Cl. 340—80 **8 Claims**



1. A stop-light monitor device for an automobile comprising, in combination:

(a) a source of current,

(b) a lighting circuit connected with said source of current,

(c) a stop-light switch connected in said lighting circuit,

(d) an operable member for actuating the stop-light switch,

(e) incandescent stop-lamp means connected in said lighting circuit and adapted to be energized when the stop-light switch is closed,

(f) a magnetic reed switch spring biased to open position,

(g) a solid state switch,

(h) means including a control circuit connected with the reed switch and solid-state switch, for closing the latter when the reed switch opens,

(i) a permanent magnet disposed in close proximity to the reed switch and adapted to maintain the same normally in closed condition against its spring bias action,

(j) current-sensitive means connected with said lighting circuit, for opening the reed switch in response to normal current supplied for energization of the stop-lamp means, said current-sensitive means maintaining the reed switch in a closed state if there is below-normal current supplied for the energization of the stop-lamp means, and

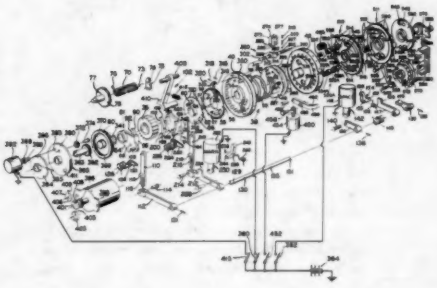
(k) a pilot indicator connected with the solid-state switch and rendered operative in response to a closed condition of said solid-state switch.

4,401,973

CYCLE LIMITING MEANS FOR AN ELECTROMECHANICAL DECODER

Peter J. Caruso, Wayne, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jan. 17, 1964, Ser. No. 338,483
Int. Cl.³ G08C *11/00*
U.S. Cl. 340—345 **14 Claims**

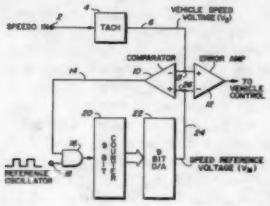


1. A mechanism comprising a base member, a shaft supported by the base member, a rotatable code wheel assembly including a first wheel element and a second wheel element, carried by the shaft a plurality of code posts carried by one of said wheel elements and normally positioned so as to lock the second wheel element to the first wheel element in driving relation, a pair of actuating means carried by the base member for selectively operating the code posts in opposite senses, said code posts including preset means for unlocking the second wheel element from the first wheel element dependent upon the selected sense of actuation of the code posts by said actuating means, each of said code posts including adjustable means for angularly positioning said preset means from a first operative position to a second locking position, means operably connected to the first wheel element for effecting a control function on rotation of the code wheel assembly in a first sense and upon the first wheel element being unlocked from the second wheel element upon completion of a predetermined sequence of operation of said actuating means, spring means for biasing the code wheel assembly in an opposite second sense so as to return the code wheel assembly to a home position to complete a cycle of operation, means for actuating the adjustable means of said code posts so as to position the preset means of the code posts from said first operative position to said second locking position to erase the predetermined sequence of operation, and means for controlling said actuating means including a counter operative in response to rotation of said code wheel assembly in said first and second senses to cause said control means to render said actuating means effective after a predetermined number of said cycles of operation.

4,401,974
DIGITAL SAMPLE AND HOLD CIRCUIT

Robert B. Jarrett, and Wilson D. Pace, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 12, 1979, Ser. No. 11,354
Int. Cl.[3] H03K 13/02, 13/20
U.S. Cl. 340—347 AD 2 Claims



1. A circuit for sampling and holding an analog voltage, comprising:

(a) comparator means having a first input for receiving an analog input signal, a second input for receiving an analog output signal, and an output for providing a comparison signal when the analog output signal is equal to or greater than the analog input signal;

(b) counter means for providing a digital value and adapted to receive clocking pulses for incrementing the digital value, said counter means including an input coupled to the output of said comparator means for preventing the digital value from being further incremented upon the occurrence of said comparison signal, the digital value having a least-significant bit corresponding to a binary weighting of 2^0 and at least one more-significant bit corresponding to a binary weighting of 2^N, where N is an integer greater than 0; and

(c) converter means having an input coupled to said counter means for receiving the digital value and an output coupled to the second input of said comparator means for providing the analog output signal, said converter means being responsive to the least-significant bit of the digital value for effecting a change in the magnitude of the analog output signal by a unity amount, said converter means being responsive to the at least one more-significant bit for effecting a change in the magnitude of the analog output signal by an amount less than 2^N-1 times said unity amount.

4,401,975
ELECTRICAL SYNTHESIS OF MECHANICAL BELL

Harry D. Ferguson, and Michael K. Slack, both of Owen Sound, Canada, assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 19, 1981, Ser. No. 323,521
Int. Cl.[3] G08B 3/10
U.S. Cl. 340—384 E 13 Claims

1. A circuit for the electrical synthesis of a mechanical bell sound and comprising in combination:

(a) a rate clock for providing signals at a predetermined stroke repetition rate;

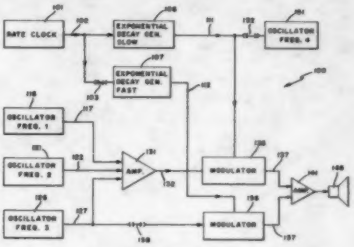
(b) a first exponential decay circuit coupled to said rate clock for producing a first decaying exponential control signal having a first predetermined time constant;

(c) a second exponential decay circuit coupled to said rate clock for producing a second decaying exponential control signal having a second predetermined time constant;

(d) first, second and third oscillators for producing signals of first, second and third frequencies, respectively, which comprise the low, intermediate and high frequencies, respectively, of the three most significant frequencies, other than that of the stroke repetition rate, of the mechanical bell to be synthesized;

(e) a first modulator adapted to produce a first output signal which is a function of two input signals and with said first control signal coupled to said modulator as one of the inputs thereto;

(f) a second modulator adapted to produce a second output signal which is a function of two input signals with said second control signal coupled to said second modulator as one of the inputs thereto;



(g) means for coupling said first, second and third frequencies to said first modulator as a second input thereto;

(h) means for coupling said third frequency to said second modulator as a second input thereto;

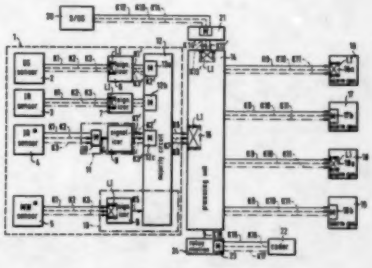
(i) means for coupling the output of said first modulator to suitable audio means; and

(j) means for coupling the output of said second modulator to said suitable audio means.

4,401,976
MULTIPLE SENSOR INTERCONNECTED ALARM SYSTEM RESPONSIVE TO DIFFERENT VARIABLES

Hans-Günther Stadelmayr, Wilhelm-Ostwaldstr. 5, D 8000 Munich 40, Fed. Rep. of Germany

Filed Jan. 14, 1981, Ser. No. 225,000
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001452; European Pat. Off., Dec. 29, 1980, 80108235.5
Int. Cl.[3] G08B 13/16, 13/18
U.S. Cl. 340—522 16 Claims



1. Alarm, safeguarding and monitoring system having a plurality of sensors in one room, comprising: at least three sensors which respond to physical phenomena of a different nature which always occur in every alarm event, said sensors being disposed to cover the same monitoring zone, and means responsive to output signals from said sensors for generating an alarm signal according to the majority principle.

4,401,977
RADIO TRANSMITTER FOR REPEATED BURSTS OF OSCILLATIONS

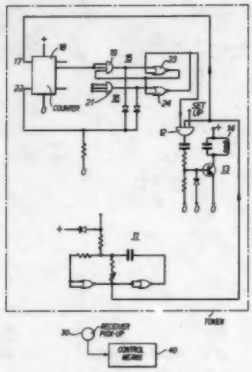
Derek R. Taylor, Barnstead, England, assignor to Mastiff Security Systems Limited, Surrey, England

Filed Jan. 6, 1981, Ser. No. 222,942

Claims priority, application United Kingdom, Jan. 7, 1980, 8000356

Int. Cl.³ H03K *3/66*

U.S. Cl. 340—539 **5 Claims**



1. A radio transmitter including a source of oscillations, an output, a gate for controlling the supply of oscillations to the output, a counter of the oscillations from the source, a logic circuit controlled by the output of the counter for opening the gate, and means responsive to the counting of a preset number of said oscillations for closing the gate and re-setting the counter, whereby the transmitter acts continuously to produce bursts of the preset number of oscillations separated by breaks in transmission, all the transmitter components being embodied in a pocket token.

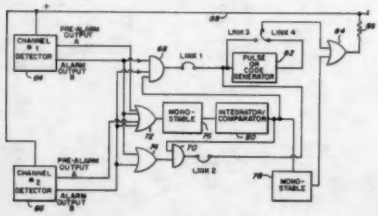
4,401,978
COMBINATION DETECTOR

Elias E. Solomon, Duxbury, Mass., assignor to The Gamewell Corporation, Medway, Mass.

Continuation of Ser. No. 13,398, Feb. 21, 1979, abandoned. This application May 1, 1981, Ser. No. 259,373

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—628 **12 Claims**



1. A combination detector for detecting smoke or fire conditions, comprising;

optical detection apparatus comprising an optical transmitter/receiver transducer means and optical detection circuitry coupled from said transducer means for sensing activation thereof and for providing an electrical signal representative of optical transducer means output,

ionization detection apparatus comprising an ionization chamber means and ionization detection circuitry coupled from said ionization chamber means for sensing operation thereof and for providing an electrical signal representative of ionization chamber means output,

first trigger comparator means associated with the optical detection apparatus and including a pre-alarm optical comparator having a pair of comparison inputs and a full alarm optical comparator also having a pair of comparison inputs,

means establishing a fixed reference voltage input at one input to the pre-alarm optical comparator,

means establishing a fixed reference voltage input at one input to the full alarm optical comparator,

means coupling the electrical signal representative of optical transducer means output to the other input of both the pre-alarm and full alarm optical comparators,

second trigger comparator means associated with the ionization detection apparatus and including a pre-alarm ionization comparator having a pair of comparison inputs and a full alarm ionization comparator also having a pair of comparison inputs,

means establishing a fixed reference voltage input at one input to the pre-alarm ionization comparator,

means establishing a fixed reference voltage input at one input to the full alarm ionization comparator,

means coupling the electrical signal representative of ionization chamber means output to the other input of both the pre-alarm and full alarm ionization comparators,

and output circuit means for receiving signals from said pre-alarm optical and ionization comparators and said full alarm optical and ionization comparators for providing at least one alarm signal in response to triggering of at least one of said comparators.

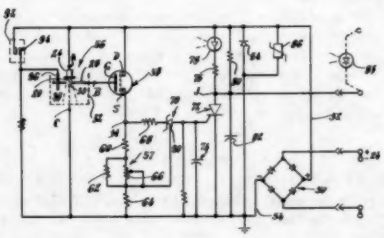
4,401,979
ELECTRICAL CONTROLS FOR IONIZATION SMOKE DETECTOR

John J. Dobrzanski, New Britain, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 11, 1981, Ser. No. 233,539

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—629 **2 Claims**



1. An ionization smoke detector system comprising:

(a) a voltage source;

(b) a detector device having a first, inner electrode; a second, intermediate electrode; and a third, outer electrode;

(c) a field effect transistor having source, drain, and gate electrodes, said field effect transistor being connected to said voltage source;

(d) said second electrode of said detector device being connected to the gate electrode of said field effect transistor, said first and third electrodes of said detector device being connected across said voltage source;

(e) an alarm device, and a silicon controlled rectifier connected to said alarm device and being operable to actuate said alarm device when sufficient threshold voltage is present at the gate electrode of said silicon controlled rectifier;

(f) a programmable Zener device having anode, cathode, and gate electrodes;

(g) an output point connected to the source electrode of said field effect transistor, a fixed, current-limiting resistor connected between said output point and the cathode of said programmable Zener device, such that the potential at the output point is fully applied to said Zener device, the anode of the Zener device being connected to the gate electrode of said silicon controlled rectifier, whereby when the potential at said output point rises sufficiently, responsive to smoke in said detector, said Zener device breaks down so as to produce conduction in said silicon controlled rectifier, said Zener device normally not being in a breakdown condition;

(h) a voltage dividing resistance network, connected at one end to said output point and at the other end to reference potential, for selecting a breakdown or threshold voltage for said programmable Zener device, said network comprising three resistors, at least one of which is a variable resistor;

(i) said variable resistor being connected to the gate electrode of said programmable Zener device to vary slightly the potential thereat so as to adjust the breakdown or threshold voltage for said programmable Zener device.

4,401,980

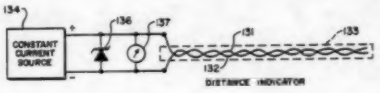
CONSTANT CURRENT ELECTRONIC INTRUDER DETECTION SYSTEM

Otto E. Rittenbach, Monmouth County, N.J., and Reinhard G. Olesch, Kronberg, Fed. Rep. of Germany, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 973,402, Dec. 26, 1978, which is a continuation-in-part of Ser. No. 840,206, Oct. 7, 1978. This application Aug. 31, 1981, Ser. No. 297,806

Int. Cl.³ G08B *13/10*

U.S. Cl. 340—666 **1 Claim**



1. An electronic intrusion detection system which comprises:

a loosely twisted cable comprising two bare conductor wires arranged in a double helix retained in that position by an easily deformed outer insulating jacket, which cable is disposed across a surveilled area where an intruder may step upon the cable and cause an at least momentary contact of the bare wires at that place of the cable;

a constant current source connected in parallel to the terminals of the two cable wires at one end of said cable;

a zener diode connected in parallel to the terminals of the said constant current source for limiting the amount of voltage present along the cable circuit; and

a meter means connected in parallel across the terminals of said current source zener diode, and said one end of said cable, having a scale for indicating the distance of intrusion along the said cable.

4,401,981

SYSTEM FOR READING MULTIPLEXED DATA

Alan A. Figler, Algonquin, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 27, 1981, Ser. No. 325,547

Int. Cl.³ G09G *3/00*

U.S. Cl. 340—715 **7 Claims**

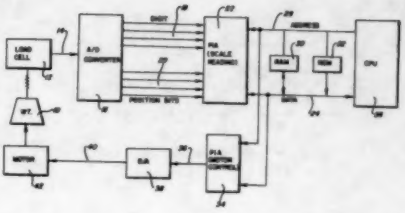
1. A method of presenting dynamically changing time-multiplexed numbers which comprises the steps of:

providing a reading sequence by (a) reading a first series of bits to obtain a first digit; and (b) thereafter reading a second series of bits to obtain a second digit;

storing the two digits obtained;

repeating the reading sequence at least twice;

comparing the two digits from each reading sequence against the two digits from the previous reading sequence;



if two consecutive reading sequences are not identical, then continuing to repeat the reading sequence; and

if two consecutive reading sequences are identical, then providing an output representing a multi-digit number.

4,401,982

FLUORESCENT DISPLAY TUBES AND METHOD OF DRIVING THE SAME

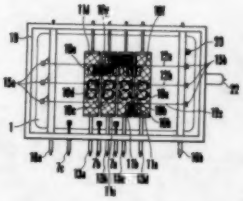
Togo Miyazaki, and Junichi Suehiro, both of Izumi, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,468

Claims priority, application Japan, May 6, 1980, 55-61569

Int. Cl.³ H01J *63/02*

U.S. Cl. 340—758 **8 Claims**



1. A fluorescent display tube comprising:

an anode arranged on a substrate and coated with phosphor according to a predetermined pattern to be displayed;

a plurality of grids disposed above said anode a predetermined distance apart therefrom, said grids being electrically isolated from each other for dividing said phosphor pattern into a plurality of sections;

means for selectively energizing said grids;

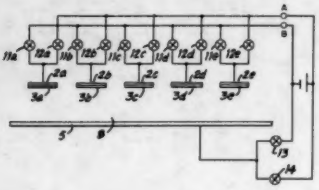
a cathode disposed above said grids a predetermined distance apart therefrom; and

whereby said predetermined pattern is displayed according to said selectively energized grids and between adjacent selectively energized grids.

4,401,983
ELECTROCHROMIC DISPLAY DEVICE EXHIBITING UNIFORM COLORATION DENSITY

Junichi Tabata, and Noboru Kaneko, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jul. 3, 1980, Ser. No. 165,501
Claims priority, application Japan, Jul. 4, 1979, 54-084858
Int. Cl.³ G09G 3/34
U.S. Cl. 340—785 **6 Claims**

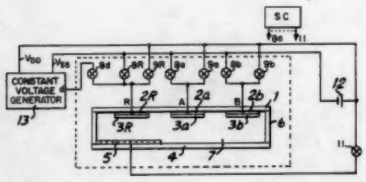


1. A driving circuit for an electrochromic display device in which electric charges for colouration in a coloured segment group are transferred to a bleached segment group to change the display state by the application of a voltage between the coloured segment group and the bleached segment group of the electrochromic display device, comprising: electric charge transfer control circuit means for producing an electric charge transfer signal only when the display information displayed by the electrochromic display device is being changed; and electric charge transfer-time control circuit means for controlling the electric charge transfer time and setting the time at more than the maximum transfer time required by the electrochromic display device both during low temperature operation and during electric charge transfer using the maximum number of segments for which electric charge transfer can be carried out by the electrochromic display device.

4,401,984
ELECTROCHROMIC DISPLAY DEVICE

Junichi Tabata, and Noboru Kaneko, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 196,119
Claims priority, application Japan, Oct. 15, 1979, 54/132605
Int. Cl.³ G09G 3/34
U.S. Cl. 340—785 **10 Claims**

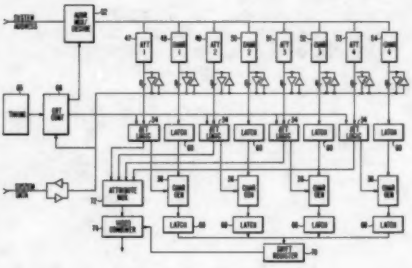


1. In an electrochromic display device having an electrolyte contained between two spaced-apart substrates: a set of display elements including first and second display elements disposed on the surface of at least one of the substrates and in contact with the electrolyte, each display element comprising a transparent electrode and an electrochromic layer disposed on the transparent electrode such that the display element exhibits either colored or bleached states depending on the amount of electric charge held by the display element; means for selectively applying a charge transfer voltage between preselected bleached and colored display elements to effect transfer of electric charges between the preselected display elements through the electrolyte to thereby change the display state of the electrochromic display device; a counter electrode disposed on the surface of the other substrate and in contact with the electrolyte; and compensating means for compensating for deterioration of the coloration exhibited by the colored display elements as a function of the number of times electric charge is transferred between the first and second display elements so as to maintain the degree of coloration of the colored display elements, the compensating means including voltage applying means for applying a constant voltage between the first display element and the counter electrode, the value of the constant voltage being lower than that of the charge transfer voltage, and control means for controlling the application of the constant voltage such that the constant voltage is applied before each predetermined number of transfers of electric charge held by the first display element to the second display element.

4,401,985
FULL PAGE DISPLAY APPARATUS FOR TEXT PROCESSING SYSTEM

James M. McVey, Florence; Hector G. Romero, Jr., and James D. Wagoner, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1981, Ser. No. 313,126
Int. Cl.³ G09G 1/02
U.S. Cl. 340—799 **10 Claims**



1. In an interactive text processing system in which a text stream input by way of a keyboard is stored and displayed to an operator, on a display device comprising a cathode ray tube and an electron beam which is modulated and scanned in a series of horizontal scans to produce an image of said text data on the screen of said display device, the combination which comprises:

storage means including a plurality of separate storage devices;

means for entering text data into said system in a format in which successive characters of said text data are each stored in separate ones of said separate storage devices;

means for accessing selected text data to be displayed from said stored text data in a format in which multiple characters are simultaneously read out from selected ones of said storage devices;

means for cyclically receiving and temporarily storing said selected text data from said storage devices;

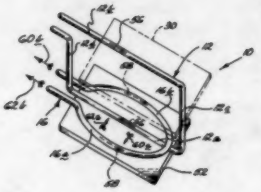
means for interleaving and serializing said selected text data to form a serial data stream of said selected text data; and

means for coupling said serial data stream to control the intensity of said electron beam in synchronism with said horizontal traces to achieve successive text line displays on said screen, each text line display including a plurality of successive horizontal traces.

4,401,986
POSITION SENSOR AND SYSTEM

George Trenkler, East Providence, R.I., and Lawrence E. Cooper, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1979, Ser. No. 106,773
Int. Cl.³ G08C 19/06
U.S. Cl. 340—870.32 22 Claims



1. A position sensor comprising an exciting coil having its convolutions disposed in a first plane, and

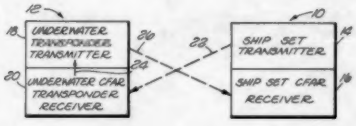
a sensing coil having its convolutions disposed in a plane intersecting the first plane, the sensing coil having corresponding portions thereof disposed substantially symmetrically relative to a first portion of the exciting coil in the first plane in mutually inductive relation to said exciting coil portion, and

means for mounting said exciting and sensing coil portions to be relatively movable with respect to mutual inductance modifying means on an object whose position is to be monitored so that the mutual inductances between said respective, corresponding sensing coil portions and said first exciting coil portion are modified relative to each other as the object is moved so that, when the exciting coil is driven, the sensing coil provides a signal representative of the position of the object relative to said exciting and sensing coil portions.

4,401,987
RANGING SYSTEM HAVING REDUCED RECOGNITION JITTER

Reginald J. Cyr, Goleta, Calif., assignor to Sonatech, Inc., Goleta, Calif.

Filed Apr. 3, 1979, Ser. No. 26,560
Int. Cl.³ G01S 13/76, 15/74
U.S. Cl. 343—5 CF 34 Claims



1. A method of reducing recognition jitter in a ranging system, comprising the steps of:

providing a limiting constant false alarm rate receiver of the type having a broad bandwidth bandpass filtering means, a narrow bandwidth bandpass filtering means and threshold-responsive recognition means;

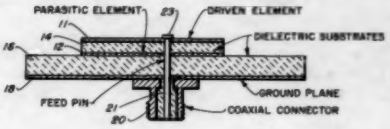
providing a pulsed recognition signal to said receiver; and

providing a conditioning signal to said receiver prior to a time of providing said pulsed recognition signal to said receiver, wherein said conditioning signal has a frequency distribution of power lying substantially within the passband of said broad bandwidth bandpass filtering means in said receiver and wherein said conditioning signal frequency distribution of power is displaced from the center of the passband of said narrow-bandwidth bandpass filtering means in said receiver to inhibit said conditioning signal driving the input signal level at said threshold-responsive recognition means in said receiver above a preselected recognition threshold level.

4,401,988
COUPLED MULTILAYER MICROSTRIP ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,490
Int. Cl.³ H01Q 1/38
U.S. Cl. 343—700 MS 12 Claims



1. A coupled multilayer microstrip antenna for improving antenna radiation pattern characteristics, comprising:

a. a thin ground plane conductor;

b. a first thin planar conducting microstrip radiating element (parasitic element) being spaced from and parallel to said ground plane;

c. said parasitic element being separated from said ground plane by a first dielectric substrate;

d. a second thin planar conducting microstrip radiating element (driven element) being spaced from and parallel to said parasitic element such that said parasitic element is located between said ground plane and said driven element;

e. said driven element being separated from said parasitic element by a second dielectric substrate;

f. said driven element and said parasitic element each being tuned to the same frequency;

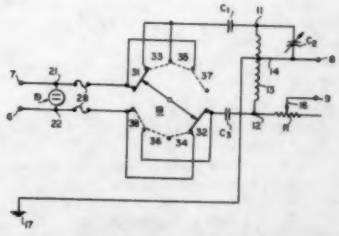
g. said driven element having at least one feed point located thereon; said feed point being directly coupled to and fed energy from a microwave transmission line;

h. said parasitic element being parasitically coupled to the driven element without any direct connection thereto; said parasitic element operating to cancel the image field as seen by the driven element to provide enhanced radiation at angles closer to said ground plane.

4,401,989
TELEVISION LINE ANTENNA APPARATUS

Telesforo Tulli, 1463 Bath Ave., Brooklyn, N.Y. 11228

Continuation of Ser. No. 185,948, Sep. 10, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,286
Int. Cl.³ H01Q 1/00
U.S. Cl. 343—905 5 Claims



1. Antenna apparatus for coupling the two conductors of a television antenna lead to the conductors of a building line comprising:

a tunable circuit, said tunable circuit comprising an inductor having first and second terminals and a tap, a tuning capacitor connected between said first terminal and said tap;
first connecting means for connecting the junction of said first terminal and said tap to one of the conductors of the antenna lead;
second connecting means for connecting said second terminal to the other conductor of the antenna lead;
third connecting means for connecting the junction of said first terminal and said tap to ground;
capacitance coupling means connected to at least one of said terminals; and
multiposition manual switching means connected between said capacitance coupling and the conductors of the building, said switching means having a first position for connecting both conductors of the building to said capacitance coupling means, said switching means having second and third positions wherein either one or the other other conductor of the building is connected to said capacitance coupling means.

4,401,990

NOZZLE CLEANING DEVICE IN AN INK JET SYSTEM PRINTER

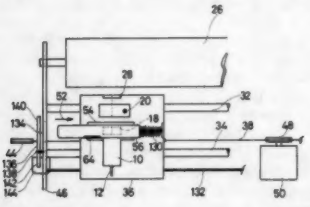
Masahiko Aiba; Yoichi Yamamoto, both of Nara; Hiroji Iwai, Yamatokoriyama, and Ikuo Umeda, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1981, Ser. No. 292,916

Claims priority, application Japan, Aug. 28, 1980, 55-119409; Jan. 13, 1981, 56-4493

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **8 Claims**



1. A nozzle cleaning device in an ink jet system printer which includes a nozzle for emitting ink droplets, comprising:
a liquid absorptive pad;
a support member for supporting said liquid absorptive pad and also supporting a charging tunnel for charging the ink droplets in accordance with print information;
shift means for shifting said support member in front of said nozzle; and
control means for activating said shift means so that said liquid absorptive pad contacts a front surface of said nozzle when said nozzle does not emit the ink droplets, and that said liquid absorptive pad is held away from said front surface of said nozzle when said nozzle emits the ink droplets.

4,401,991

VARIABLE RESOLUTION, SINGLE ARRAY, INTERLACE INK JET PRINTER

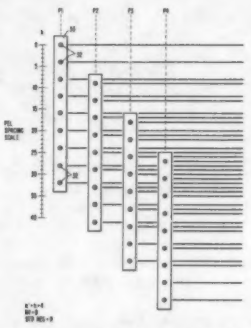
Van C. Martin, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1981, Ser. No. 309,964

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **10 Claims**

1. In an interlace ink jet printer having a single array containing a plurality, Nt, of nozzles with the nozzles uniformly spaced kD apart, where D is the width of a pel spacing, Nt is the number of nozzles on the array and k is an integer, and having means for passing the print head repeatedly across the print media, means for translating the ink jet print head Nt pel spacings of width D during each pass of the print head across the print media, and means for processing print-data for printing on print lines one pel spacing width D apart, improved apparatus for controlling the printing of various resolutions by the print head, said improved apparatus comprising:
means for setting a pseudo pel spacing width D′, where D′ equals (k′/k)D, and k′ is an integer and has no common



factor with Nt, to provide a new resolution R′ equal to (k′/k)R where R is the old resolution;
translational contro¹ means responsive to said setting means for controlling said translating means to translate said print head Nt pseudo pel spacings of width D′ during each pass of the print head across the print media;
data control means responsive to said setting means for controlling said print-data processing means to process said print-data for printing on print lines one pseudo pel spacing width D′ apart.

4,401,992

METHOD OF MARKING A SYNTHETIC MATERIAL SURFACE AND TO AN OBJECT HAVING THE MARKED SYNTHETIC MATERIAL SURFACE

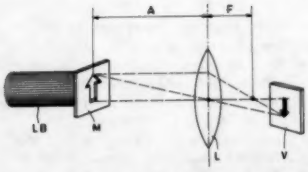
Henricus H. M. Vorst; Jozef J. J. Bastiaens, and Enno C. Munk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 238,273

Claims priority, application Netherlands, Mar. 25, 1980, 8001731

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 L **5 Claims**



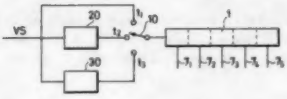
1. A method of marking an object having a synthetic resin surface by causing a color contrast pattern to be formed in said surface by exposure of said surface to a laser beam, characterized in that present in said surface is a colored inorganic silicate pigment or a mixture of a dye and a silicate glass and that desired areas of said surface are exposed to a laser beam having an intensity of at least 1000 kw/cm², measured on said surface,

thereby decomposing said inorganic silicate pigment or said dye at said exposed areas and thereby changing the color of said exposed areas of said surface.

4,401,993
HEAT-SENSITIVE TYPE MULTI-GRADATION IMAGE RECORDING APPARATUS

Haruhiko Moriguchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,290
Claims priority, application Japan, Aug. 25, 1980, 55-115915
Int. Cl.³ G01D *15/10;* **H05B** *3/00;* **H04N** *1/22*
U.S. Cl. 346—76 PH **3 Claims**

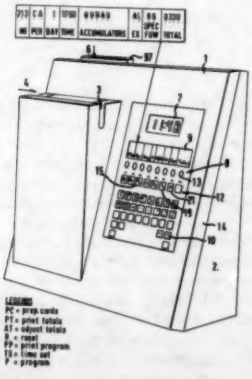


1. A heat sensitive type multi-gradation image recording apparatus comprising:
- a plurality of heat generating resistance elements arranged one-dimensionally in correspondence to picture elements;
- means for converting a video signal into a plurality of binary video signals using different threshold values said means comprising a plurality of comparators being coupled commonly to receive said video signal, each of said comparators having a different threshold value, a switch having input contacts receiving outputs from said comparators, and a shift resistor having a serial input coupled to an output contact of said switch; and
- means for supplying electrical energy to said heat generating resistance elements controlled by said binary video signals to record an image in an overlap mode.

4,401,994
RECORDERS FOR RECORDING DATA

Alan G. Witts, Wimborne, and Philip St. Clair Wilshire, Blandford Forum, both of England, assignors to Custom Microdesign Limited, Dorset, England

Filed Jan. 21, 1982, Ser. No. 341,228
Claims priority, application United Kingdom, Jan. 22, 1981, 8101944
Int. Cl.³ G07C *1/06*
U.S. Cl. 346—83 **27 Claims**

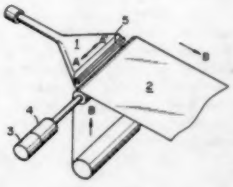


1. A time/cost recorder for use in recording entry and exit transactions by badges bearing digitally encoded machine readable identity information and by cards bearing both digitally encoded machine readable identity information in the same recording medium and format and printed information in visible characters referring to the entry and exit transactions comprising:
- read-only memory means for storing constant instructions for operation of the recorder;
- random-access memory means including locations severally allocatable to the badges and cards for recording data relating to the entry and exit transactions of each badge and/or card according to the identity thereof;
- a badge reader for reading the digitally encoded data on a badge inserted therein;
- a combined card reader/printer including means defining a path for card insertion and discharge, card transport means including a drive motor for advancing an inserted card into the reader and ejecting it therefrom, a reader for reading the digitally encoded information on a card inserted therein and a printer assembly for printing visible characters on the inserted card;
- a clock for supplying time signals; and
- a digital data processing and control system that receives the time signals and is arranged on receipt of a badge by the badge reader to update the memory locations referring to that badge in accordance with the indicated time and on receipt of a card by the reader/printer to cause the transport means to convey the card into the reader/printer so that the recorded information is read by the reader the memory locations referring to that card are updated in accordance with the indicated time, visible characters are printed on the card recording the transaction and the card processed is ejected from the reader printer whereby an identity may be allocated interchangeably to a card or to a badge either of which may be used to record an entry or exit transaction.

4,401,995
CHART RECORDER RECORDING METHOD AND APPARATUS

Hiroshi Sato, Fujisawa, Japan, assignor to Daiichi Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 30, 1980, Ser. No. 221,410
Claims priority, application Japan, Jan. 25, 1980, 55-006768
Int. Cl.³ G01D *9/00*
U.S. Cl. 346—110 R **5 Claims**



1. A chart recorder using a fiber optics tube, said recorder comprising:
- a vertical deflection circuit;
- a vertical deflection yoke whose input is connected to an output of said vertical deflection circuit and which is attached to said fiber optics tube, said vertical deflection circuit including a saw-tooth oscillator;
- a horizontal deflection circuit;
- a horizontal deflection yoke whose input is connected to the output of said horizontal deflection circuit and which is attached to said fiber optics tube; and
- a timing controller which controls the timing of said vertical deflection circuit and said horizontal deflection circuit;

wherein said horizontal deflection circuit comprises:
- a primary sample hold circuit, data signals obtained from a

sampling being fed into an input of said primary sample hold circuit;

a secondary sample hold circuit whose input is connected to a first output of said primary sample hold circuit;

an adder whose input is connected to an output of said secondary sample hold circuit;

a differential amplifier whose first input is connected to said output of said secondary sample hold circuit and whose second input is connected to a second output of said primary sample hold circuit;

a V/I converter whose input is connected to an output of said differential amplifier;

a switch circuit whose first terminal is connected to an output of said adder and whose second terminal is connected to an output of said V/I converter; and

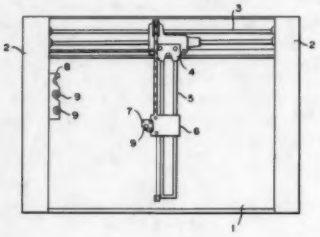
a capacitor which is charged by signals from said switch circuit.

4,401,996

APPARATUS FOR RECORDING-PEN INTERCHANGE

Atsushi Shirahata, Tokyo, Japan, assignor to Watanabe Sokki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,432
Claims priority, application Japan, Sep. 1, 1980, 55-119813
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—139 R **16 Claims**



14. A pen interchange apparatus comprising:

a relatively movable pen-holder with a pen entrance-egress slot angled in a first direction;

a relatively stationary pen-holder with a pen entrance-egress slot angled at a second direction that is angled with respect to said first direction; and

control means for moving said movable pen-holder in a V-shaped pen interchange pattern, said control means first moving the pen-holder toward and into pen transfer contact with said stationary pen-holder from a direction in alignment with only one of said entrance-egress slots and for thereafter moving the movable pen-holder away in a direction generally in alignment only with the other of said entrance-egress slots.

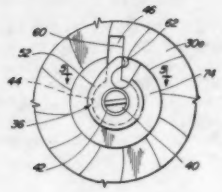
4,401,997

CHART HAVING IMPROVED SEPARABILITY FROM A STACKED ARRAY

George G. Hausner, Jr., Cheektowaga, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,977
Int. Cl.³ G01D *15/24*
U.S. Cl. 346—137 **7 Claims**

7. In a chart drive mechanism including a chart support shaft for carrying a plurality of stacked charts, a rotatably shiftable chart-changing slotted hub encircling said shaft, a hub lip, said lip defining a blade-like terminus of said hub at a slot in said hub, said blade-like terminus being operable during periodic chart changing rotation of the hub to interleave between a top chart and charts therebeneath to displace and to separate the top chart from a staacked array of charts therebeneath, and to demount the chart from the support shaft; the improvement wherein said hub has a truncated marginal portion opposing said blade-like terminus of said hub, thereby obviating application of hub-derived pressure against the top chart at a zone



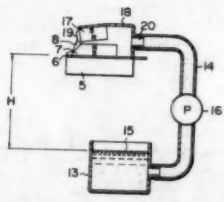
thereof beneath said truncated marginal portion of said hub and to prevent downward displacement of the top chart in a sector of the chart opposite said blade-like terminus.

4,401,998

MAGNETIC FLUID RECORDING APPARATUS

Masaharu Ushihara, Hirakata; Michinori Nagahiro, Katano; Humio Yamazaki, Hirakata; Masami Nakagawa, Kadoma; Noboru Miyaji, Neyagawa, and Susumu Maruno, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1981, Ser. No. 330,607
Claims priority, application Japan, Dec. 19, 1980, 55-180715
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **6 Claims**

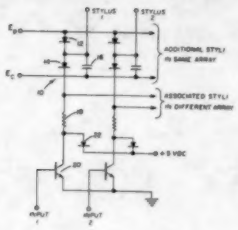


1. A magnetic fluid recording apparatus having at least one recording electrode made of a magnetic material and disposed to oppose to a recording surface, and at least one exciting magnet disposed in contact with said recording electrode and adapted to magnetize said recording electrode thereby to make a magnetic fluid attaching to said recording electrode to protrude from the latter, the protruded magnetic fluid being made to fly or migrate toward said recording surface in accordance with a picture signal thereby to form a picture on said recording surface, the improvement wherein said apparatus comprises a magnetic fluid storage portion disposed beneath said exciting magnet, and at least one pipe connected between said exciting magnet and said magnetic fluid storage portion, one end of said pipe being positioned to oppose to said exciting magnet to form a small gap therebetween, said small gap being adapted to be completely covered, when said magnetic fluid is attached to said exciting magnet and charged into said pipe, by said magnetic fluid attaching to said exciting magnet.

4,401,999
ELECTROSTATIC HIGH VOLTAGE DRIVE CIRCUIT USING DIODES

Arling D. Brown, Jr., Cleveland Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 6, 1980, Ser. No. 204,494
Int. Cl.³ G01D 15/06
U.S. Cl. 346—154 12 Claims



1. A switching circuit comprising:

a high stored charge diode having an anode and cathode; a capacitor, one side of said capacitor operatively connected to the anode of said high stored charge diode defining an output;

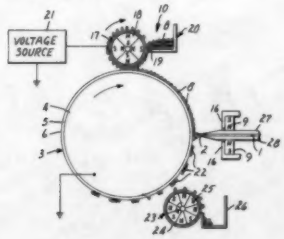
means for selectively impressing a forward voltage across said high stored charge diode for causing current to flow in a forward direction;

means for selectively impressing a reverse drive voltage to the other side of said capacitor, causing the voltage at said output to be shorted by said high stored charge diode when a forward voltage was previously impressed across said high stored charge diode and such that said reverse drive voltage will be coupled through said capacitor and the output not shorted by said high stored charged diode when no forward voltage was previously impressed across said high stored charged diode.

4,402,000
ELECTROGRAPHIC RECORDING METHOD AND APPARATUS WITH CONTROL OF TONER QUANTITY AT RECORDING REGION

George W. Fabel, Banks, Oreg., and Richard W. Lindahl, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 22,859, Mar. 22, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,069
Int. Cl.³ G01D 15/00
U.S. Cl. 346—155 23 Claims



1. Electrographic apparatus for use with dry, electronically conductive toner including:

first and second electrodes in spaced opposing relationship wherein said first electrode is stationary;

a receptor recording member spaced from said first electrode for providing a recording region between said first electrode and said receptor recording member, the receptor recording member adapted for making electronic contact with said second electrode, said receptor recording member adapted for movement relative to said first electrode;

means for supplying the toner to said recording region in a regular or relatively uniform rate for deposition on said receptor recording member as toner images;

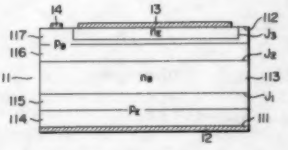
force producing means for providing a temporally relatively constant force at said first electrode acting on the toner when supplied to said recording region to cause the toner to span the space between said first electrode and said receptor recording member to establish an electronically conductive path via the toner between said first electrode and said receptor recording member; and

means adapted to apply recording electrical potential signals to said first electrode relative to said second electrode concurrent with the operation of said force means and movement of said receptor recording member relative to said first electrode for causing some of the toner of said recording region to be held on said receptor recording member as toner images, said force producing means also providing a temporally relatively constant force for removing a portion of the toner from said recording region and from electronic contact with the toner at said recording region for maintaining a constant quantity of toner in said recording region, the toner removed from said recording region by said force means being toner that accumulates in excess of said constant quantity due to changes in the amount of toner supplied to said recording region and the amount of toner held on said receptor recording member as toner images.

4,402,001
SEMICONDUCTOR ELEMENT CAPABLE OF WITHSTANDING HIGH VOLTAGE

Naohiro Momma, and Hiroyuki Taniguchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1978, Ser. No. 868,791
Claims priority, application Japan, Jan. 24, 1977, 52-5787
Int. Cl.³ H01L 29/74, 29/06
U.S. Cl. 357—38 12 Claims



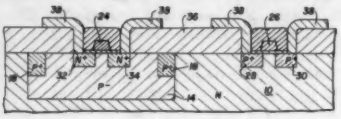
1. In a semiconductor element capable of withstanding a high voltage including a semiconductor substrate which has a pair of major surfaces disposed in opposition to each other, at least an n-conductivity type layer disposed interiorly of said substrate, a p-conductivity type layer disposed adjacent to said n-conductivity type layer and forming a pn-junction in cooperation with said n-conductivity type layer, said p-conductivity type layer being composed of a first layer region located adjacent to said pn-junction and a second layer region located remote from said pn-junction and having a higher impurity concentration than said first layer region, and a pair of electrodes each contacted to each of said major surfaces of said substrate with a low ohmic resistance, the improvement comprising:

means for reducing thermal loss in said element by lengthening the lifetime of minority carriers in said n-conductivity type layer comprising aluminium diffused as an impurity in said second region of said p-conductivity layer.

4,402,002
RADIATION HARDENED-SELF ALIGNED CMOS AND METHOD OF FABRICATION

Thomas J. Sanders, and William H. White, both of Indialantic, Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 893,929, Apr. 6, 1978, Pat. No. 4,313,768.
This application Sep. 25, 1980, Ser. No. 190,515
Int. Cl.³ H01L 27/02, 23/48, 29/46
U.S. Cl. 357—42 4 Claims



1. A pair of CMOS devices having self-aligned gates comprising:

a silicon substrate of a first conductivity type;

a first region of a second conductivity type opposite said first impurity type formed in said substrate;

a layer of a silicon oxide forming the gate oxide over a portion of said substrate and of said first region;

a silicon doped aluminum gate on said silicon oxide layer over each of said portions;

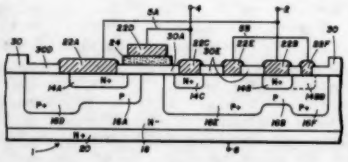
ion implanted source and drain region of said first impurity type in said first region having adjacent edges vertically aligned with the edges of its respective gate; and

ion implanted source and drain regions of said second impurity type in said portion of said substrate having adjacent edges vertically aligned with the edges of its respective gate.

4,402,003
COMPOSITE MOS/BIPOLAR POWER DEVICE

Richard A. Blanchard, Los Altos Hills, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Filed Jan. 12, 1981, Ser. No. 224,078
Int. Cl.³ H01L 57/02
U.S. Cl. 357—43 15 Claims

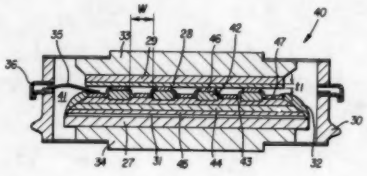


1. An integrated semiconductor device comprising in combination a bipolar transistor element and a FET element each sharing main output terminals and each having an individual input terminal, and input circuit means for coupling each of said individual inputs to a common main input terminal, said input circuit means comprising semiconductor device means for serially coupling said main input terminal to the input terminal of at least one of said elements.

4,402,004
HIGH CURRENT PRESS PACK SEMICONDUCTOR DEVICE HAVING A MESA STRUCTURE

Masami Iwasaki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 145,508, Apr. 30, 1980, abandoned, which is a continuation of Ser. No. 956,608, Nov. 1, 1978, Pat. No. 4,246,596. This application Mar. 25, 1982, Ser. No. 361,505
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ H01L 23/42, 23/44, 23/46
U.S. Cl. 357—79 9 Claims



1. Press pack semiconductor device comprising:

(a) a semiconductor element having two main surfaces, at least one mesa formed on one of the main surfaces, a first electrode formed on the top of said mesa, a second electrode formed on the bottom of said mesa, and a third electrode formed on the other main surface;

(b) a supporting plate fixed to said third electrode;

(c) a first intermediate sheet contacting the surface of said first electrode, the thickness of said first intermediate sheet being equal to or less than half of the ditch width of said mesa

(d) a first disc and a second disc respectively electrically connected through said first intermediate sheet to said first electrode and through said supporting plate to said third electrode;

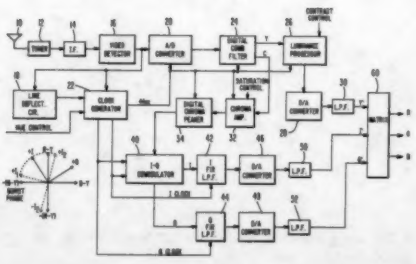
(e) an insulating housing surrounding said semiconductor element; and

(f) a lead electrically connected to said second electrode and extending outside of said insulating housing.

4,402,005
CLOCK GENERATOR FOR A DIGITAL COLOR TELEVISION SIGNAL RECEIVER

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,270
Int. Cl.³ H04N 9/535
U.S. Cl. 358—28 13 Claims



1. In a television receiver, including a source of analog video signals containing chrominance signal components and a color burst signal component; and digital video signal processing

circuitry having an input for receiving digitized video signals and an output at which processed video signals are produced; apparatus comprising:

an analog-to-digital converter having a signal input coupled to receive said analog video signals, an output coupled to the input of said digital video signal processing circuitry, and a sampling signal input;

a sampling signal generating circuit having an input coupled to receive said analog video signals and an output coupled to said sampling signal input of said analog-to-digital converter for applying a sampling signal thereto having a frequency which is a multiple of the frequency of said color burst signal component, said sampling signal generating circuit including

means, responsive to said color burst signal component, for generating said sampling signal in predetermined phase relationship with said color burst signal component and at said frequency which is a multiple of the frequency of said color burst signal component; and

a tint control circuit, coupled to said sampling signal generating means for varying said predetermined phase relationship in response to a user control for controllably shifting the phase of said sampling signal with respect to that of said color burst component, said tint control circuit including

means, including an adjustable impedance element as said user control, for producing a control signal which is continuously variable over a given range as said impedance element is adjusted, and

a second analog-to-digital converter responsive to said variable control signal for generating digital control signals representing the magnitude of said variable control signal, wherein

said means for generating said sampling signal includes

means for developing a plurality of successively delayed sampling signals, and

multiplexer means having a plurality of inputs to which ones of said successively delayed sampling signals are respectively applied, an output, and a plurality of address inputs to which said digital control signals produced by said second analog-to-digital converter are applied for selectively coupling one of said successively delayed sampling signals to the output of said multiplexer means as said sampling signal according to the magnitude of said variable control signal,

whereby tint information as represented by said processed video signals differs from that represented by said analog video signals according to adjustment of said user control.

4,402,006

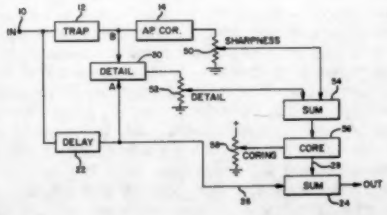
IMAGE ENHANCER APPARATUS

James A. Karlock, 3311 NE. 35th Ave., Portland, Oreg. 97212

Filed Feb. 23, 1981, Ser. No. 236,985

Int. Cl.³ H04N *9/535, 5/14*

U.S. Cl. 358—31 **16 Claims**



1. Image enhancer apparatus comprising:

means for providing a video signal,

aperture correction means for receiving said video signal and selectively detecting transistions in said video signal by providing an output corresponding to the second derivative of said video signal,

detail enhancing means for receiving said video signal and providing an output having large transitions in said video signal suppressed while retaining transitions representing detail,

and means for combining the outputs of said aperture correction means and said detail enhancing means with said video signal.

4,402,007

DIGITAL MASKING OPERATION METHOD AND MACHINE

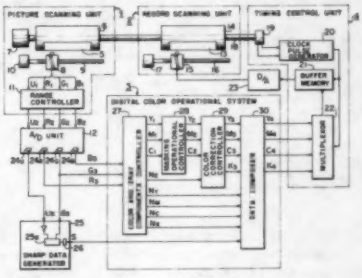
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 142,649, Apr. 22, 1980. This application May 14, 1982, Ser. No. 378,188

Claims priority, application Japan, Apr. 23, 1979, 54-49080

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—75 **19 Claims**



1. A picture reproducing method, comprising

scanning an original color picture and producing a plurality of picture density signals therefrom corresponding to a plurality of primary colors,

converting said picture density signals into digital picture signals,

providing a color operator for each of said primary colors, each color operator including a plurality of memory tables, one for each of said primary colors,

addressing the memory tables of each color operator with said respective digital picture signals thereby producing predetermined outputs from said memory tables and adding together the outputs from the memory tables of each color operator to provide a masking color signal for the respective one of said primary colors corresponding to that color operator, and

transmitting said masking color signals to a recording head for recording a reproduction picture on a recording film.

4,402,008

WIDEBAND SWITCHING ARCHITECTURE

Kari T. Terasiinna, Woodridge, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 27, 1981, Ser. No. 296,810

Int. Cl.³ H04N *7/10*

U.S. Cl. 358—86 **12 Claims**

1. For use in a wideband switching system for the switching of wideband signals with a minimal of crosstalk between switched wideband signals:

a wideband switching network;

a source of potential;

a plurality of wideband signal sources each of said sources transmitting a wideband signal to said network;

a plurality of wideband signal receivers each connected to

said network and having capabilities of receiving one of said transmitted signals;

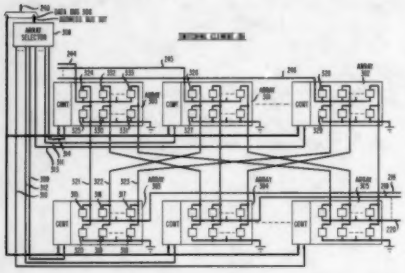
said network having a first and a second stage;

each of said stages having a plurality of switching elements;

each of said switching elements having a plurality of input switching arrays and a plurality of output switching array with each of said input switching arrays having one input terminal and a plurality of output terminals and each of said output switching arrays having one output terminal and a plurality of input terminals;

each of said input switching arrays further comprises a first set of crosspoints for connecting that input switching array's input terminal to one of that input switching array's output terminals and a second set of crosspoints for connecting all other output terminals of that input switching array to said source of potential;

each of said output switching arrays further comprises a



third set of crosspoints for connecting that output switching array's output terminal to one of that output switching array's input terminals and a fourth set of crosspoints for connecting all other input terminals of that output switching array to said source of potential;

each of said output terminals of said input switching arrays connected to a different one of said input terminals of said output switching arrays within each of said switching elements;

each of said input terminals of said input switching arrays of said first stage connected to a different one of said wideband signal sources, and each of said output terminals of said switching output arrays of said first stage connected to a different one of said input terminals of said input switching arrays of said second stage; and

each of said output terminals of said switching output array of said second stage connected to a different one of said wideband signal receivers.

4,402,009

METHOD AND APPARATUS FOR ENHANCING AN INCOMPLETE, LIMITED BANDWIDTH PICTURE GENERATED BY AN IMAGE SENSOR

Dieter Rathjens, and Gerhard Schöne, both of Wedel, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,150

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014262

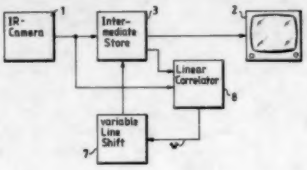
Int. Cl.³ H04N *7/18*

U.S. Cl. 358—125 **11 Claims**

1. In combination with a picture display device and an image sensor, said image sensor generating incomplete vertical bandwidth limited sequential image signals wherein each image signal comprises a plurality of alternate lines containing information, the lines interposed between said information containing lines being blanked, the method comprising the steps of:

storing a first of said incomplete sequential image signals;

combining said first stored incomplete sequential image signal with the next incomplete sequential image signal to form a complete image signal, said complete image signal comprising alternate lines containing the information in



said next incomplete sequential signal and the lines therebetween containing the information in said first of said incomplete sequential image signals; and

displaying said complete image signal on said display device.

4,402,010

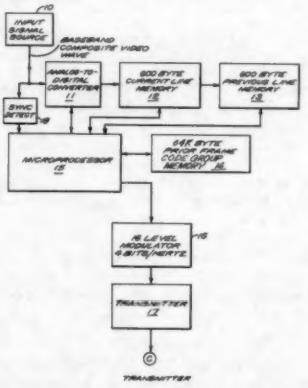
DIGITAL TELEVISION SIGNAL PROCESSING AND TRANSMISSION SYSTEM

Joseph Vogelman, Roslyn, N.Y., assignor to VVS Energy Patent Fund, Inc., Atlantic Beach, N.Y.

Continuation-in-part of Ser. No. 282,018, Jul. 10, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 457,047

Int. Cl.³ H04N *5/04*

U.S. Cl. 358—133 **11 Claims**

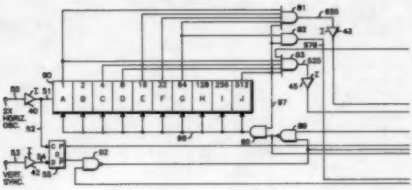


1. In combination in means for processing and transmitting a television signal; an analog-to-digital converter for generating sampled digital values of a television signal; a current line memory connected to a previous line memory means for storing the digital values for a current and previous television signal line, respectively; a prior frame code group memory for storing the code group transmitted during corresponding lines of a prior frame; microprocessor means connected to said analog-to-digital converter to said current line and previous line memories, and to said prior frame code group memory, said microprocessor means including code generating means for generating predetermined code groups signalling a correspondence between the sampled television line being processed, a previous line stored in said previous line memory or the corresponding line of the previous frame stored in said memory therefor, intra-line code producing means for generating coding characterizing changes within a line, and code output supplying means for selecting the outgoing code group from the outputs of said code generating means and said intra-line code producing means.

4,402,011
VERTICAL SYNC COUNTER WITH AUTOMATIC RECOGNITION OF TV LINE STANDARD

Anthony D. Newton, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 19, 1981, Ser. No. 312,564
Int. Cl.³ H04N 5/10
U.S. Cl. 358—154 13 Claims



1. A vertical counter for a TV receiver having a horizontal oscillator for providing horizontal sync pulses which are coupled to at least said counter to be counted thereby:

said counter being adapted to provide output pulses to a vertical sweep generator,

said counter being adapted to receive a vertical sync pulse, and sync pulse occurring in at least one of two frequencies, with respect to said horizontal sync pulses, at any given moment,

wherein said vertical counter is characterised by having at least a first mode of operation wherein said counter counts to a first predetermined number of said horizontal pulses corresponding to reception of said vertical sync pulse at a first frequency, after which said vertical counter is reset, and having at least a second mode of operation wherein said counter counts to a second predetermined number of said horizontal pulses corresponding to reception of said vertical sync pulse at a second frequency, after which said vertical counter is reset,

said vertical counter comprising means responsive to said horizontal pulses and to said vertical sync pulses for providing a change signal indicative of a change from reception at one frequency to reception at a different frequency, said vertical counter changing automatically between said first and second modes of operation in response to said change signal.

4,402,012
TWO-DIMENSIONAL DIGITAL LINEAR INTERPOLATION SYSTEM

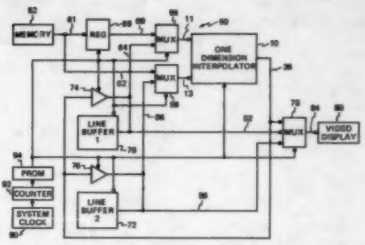
Wesley W. Knight, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,890
Int. Cl.³ H04N 5/14, 7/12
U.S. Cl. 358—160 11 Claims

1. A two-dimensional digital interpolation system comprising:

A. one-dimensional linear interpolator means for providing interpolated data values between pairs of input data values to generate primary interpolated scan lines for a video image; and

B. means for providing selected output data values of said primary interpolated scan lines as input data to said one-dimensional linear interpolater means for interpolation in

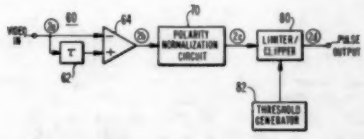


a dimension perpendicular to said primary interpolated scan lines to generate intermediate interpolated scan lines.

4,402,013
VIDEO SIGNAL ANALYZER

Robert A. Wargo, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,436
Claims priority, application United Kingdom, Apr. 6, 1981, 8110693
Int. Cl.³ H04N 5/14
U.S. Cl. 358—160 17 Claims



1. In a signal processing system, including means for producing a video signal, apparatus for analyzing the signal transition characteristic of said video signal comprising:

means, responsive to said video signal, for producing a sequence of transition-representative signals referenced to a predetermined level;

means, responsive to said sequence to transition-representative signals, for passing transition-representative signals of a given polarity or polarities with respect to said predetermined level;

means, responsive to signals passed by said signal passing means, for producing a sequence of position-modulated pulse only when said transition-representative signals passed by said signal passing means exceed said predetermined level by a given amount; and

means, responsive to said sequence of position-modulated pulses, for evaluating the time relationships between ones of said pulses over a given time interval to produce a control signal for controlling a predetermined characteristic of said signal processing system.

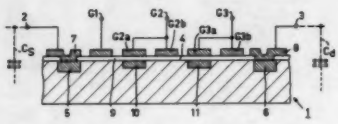
4,402,014
CIRCUIT ARRANGEMENT FOR DISCHARGING A CAPACITY

Marino G. Carasso; Bernardus H. J. Cornelissen, and Johannes G. van Santen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1981, Ser. No. 286,232
Claims priority, application Netherlands, Jul. 29, 1980, 8004328
Int. Cl.³ H04N 3/16, 3/14; H03K 17/60
U.S. Cl. 358—217 17 Claims

1. A semiconductor device comprising a semiconductor

body having a switching device for transferring a quantity of charge Q_s from a first capacitor C_s to a second capacitor Cd within a time interval T having a definite duration, characterized in that means are provided for periodically transferring during said time interval a fixed quantity of charge Q_f back to



C_s at a frequency n/T, where n and Q_f are chosen so that for a period of $t<T$, where t is measured from charge transport, charge transferred from C_s per unit of time is approximately equal to charge transferred back into C_s in the same unit of time, and the potential of C_s is substantially independent of Q_s.

4,402,015

PICTURE SIGNAL PRE-PROCESSING METHOD FOR A PICTURE REPRODUCING MACHINE

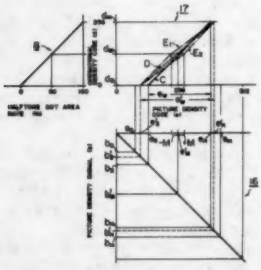
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 9, 1981, Ser. No. 223,910

Claims priority, application Japan, Jan. 21, 1980, 55-5587

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **6 Claims**



1. A method for pre-processing a picture signal prior to an operational circuit of a picture reproducing machine wherein an original picture is scanned photoelectrically to obtain the picture signal, comprising the steps of:

(a) reading out first conversion characteristic data stored in a memory which disposed at the prior stage of a preprocessor means so that a desired reproductible density range of an original picture may be converted to a density range which can be processed by operation of said picture reproducing machine by addressing addresses of the memory by the picture signal; and

(b) changing the first conversion characteristic data by second conversion characteristic data depending on a desired reproducible density range of the original picture.

4,402,016

APPARATUS FOR THE PHOTOGRAPHIC RECEPTION OF IMAGES TRANSMITTED BY MEANS OF A MODULATED ELECTRICAL SIGNAL

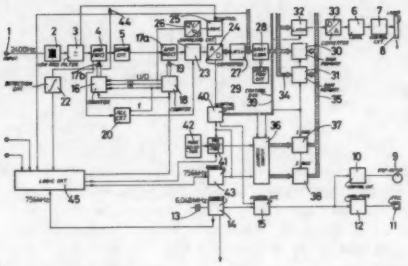
Christian Muller, Le Landeron, Switzerland, assignor to Compagnie Industrielle Radioelectrique, Switzerland

Filed Apr. 21, 1981, Ser. No. 256,040

Claims priority, application Switzerland, Jun. 16, 1980, 4607/80

Int. Cl.³ H04N *1/04, 1/40*

U.S. Cl. 358—280 **3 Claims**



1. Apparatus for the photographic reception of images transmitted by means of a modulated electrical signal, comprising means for receiving and demodulating the electrical signal to provide an analog signal, a laser providing a beam of modulated intensity, and means for sweeping the beam across a photo-sensitive sheet driven by a stepping motor, characterised by means for sampling the analog signal to obtain samples representing elementary points, means for converting the samples into digital signals defining elementary points, memories for storing the digital signals, means for reading the stored digital signals from the memories, means for converting the read out digital signals into analog signals representing elementary points, means for modulating the laser with the analog signals representing elementary points, means for repeating the elementary points; said memories comprising two memories connected in tandem and controlled as a duplex arrangement, one memory filling up whilst the other is read and vice versa, and the memories being arranged to operate such that digital signals representing a line of points are stored once and reproduced 2.n times (n being a whole number other than 0), an image area being constituted by the repetition of 2 times 21/2 elementary points, and means provided for controlling the repetition of each elementary point n times horizontally and each line 2.n times to enlarge the image point n times.

4,402,017

OPTICAL SCANNING SYSTEM UTILIZING LIGHT-EMITTING DIODES

Hideaki Takei, Tokyo, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 22, 1981, Ser. No. 304,462

Claims priority, application Japan, Oct. 3, 1980, 55-140446

Int. Cl.³ H04N *1/12*

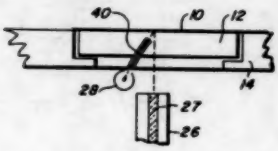
U.S. Cl. 358—293 **1 Claim**

1. An optical scanning system for scanning an original document lying on a transparent substrate and for generating electrical signals representative thereof, the system comprising an optical assembly including a light-emitting linear array spaced apart from, and parallel to said document,

means to selectively activate said light emitting array to produce a band of radiation directed towards said document, a linear lens array placed between said light emitting array and document, said lens array adapted to focus

said illumination band as a narrow scan line on said document,

light detecting means adjacent said substrate to collect reflected light and generate a signal representative of the scanned information,



means to produce relative movement between said optical assembly and said document and further including fiber optic guide means positioned between said scanned line and said collector and formed as part of said substrate.

4,402,018

SYSTEM USING A ROTATING MEDIUM FOR RECORDING CINEMATOGRAPHIC PICTURE IMAGES

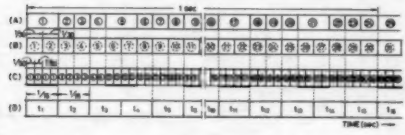
Yoshiyo Wada; Hisao Kinjo, both of Yokohama; Keiji Ozawa, Yamato; Kazuo Tatsuguchi; Kunio Goto, both of Yokohama, and Atsumi Hirata, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

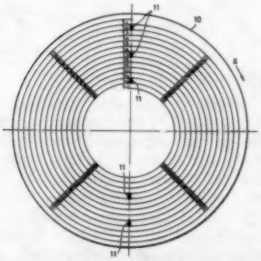
Continuation of Ser. No. 46,556, Jun. 7, 1979, abandoned. This application Jun. 4, 1981, Ser. No. 270,592

Claims priority, application Japan, Jun. 9, 1978, 53-69630

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—342 **3 Claims**





3. A process for converting images on a motion picture film into a video signal, said film being recorded in the form of 24-frames per second and said video signal being displayed at 60-fields per second, said process comprising:

(a) repeating video signals derived from a first motion picture frame as four consecutive video fields;

(b) repeating video signals derived from each of the next three film frames two times in order to provide the next six video fields; whereby said four film frames produce a 4-2-2-2 conversion into video signals;

(c) generating reference gating signals for identifying the beginnings and ends of each 4-2-2-2 conversion;

(d) arranging each 4-2-2-2 conversion responsive to said reference signal to have a specific position relative to a vertical blanking period in said video signals; and

(e) recording four fields on each turn of a spiral track on a recording disk which is rotating at 900 r.p.m.

4,402,019

MAGNETIC RECORDING/REPRODUCING APPARATUS

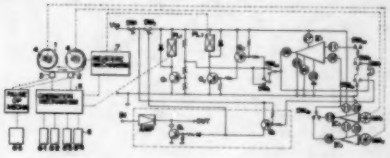
Satoshi Takagi, and Toshio Watanabe, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 36,527, May 7, 1979, abandoned. This application Sep. 25, 1981, Ser. No. 305,702

Claims priority, application Japan, May 8, 1978, 53-60834[U]; May 8, 1978, 53-60835[U]

Int. Cl.³ G11B *15/18, 19/02*

U.S. Cl. 360—71 **6 Claims**

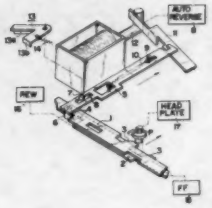


1. In a recording/reproducing apparatus including: recording head means for recording a signal on a cassette tape or reproducing a recorded signal therefrom; individually manually operable operation means for respectively effecting in their operative conditions recording, reproducing, fast feed, and rewinding operations; operation mechanism responsive to the operated condition of the operation means calling for a recording or reproducing operation for moving said recording head means against the tape of the cassette and driving said tape in a forward direction, and responsive to the operated condition of the operation means calling for a fast feed or rewind operation for removing said recording head means from the tape and driving the tape at a desired speed and direction; and tape drive reversing mechanism having an initial inoperative condition and operable to an operative condition which reverses the direction in which the tape is driven; the improvement which comprises hold means responsive in an initial operative condition to the operation of any of said operation means to said operated condition which produces said recording, reproducing, fast feed or rewinding operation for holding the operation means involved in its operated condition to effect the operation called for thereby, and releasing the same therefrom when operated to a releasing condition; reverse activating means operable between an initial inoperative to an operative condition which operates said reversing mechanism to reverse the direction of feed of said tape; detecting means for detecting an end of tape condition; control means for initially operating said hold means and activating means respectively in said initial operative and inoperative conditions while the tape is being driven; and a plurality of switch means both controlling and responsive to the condition of said control means and having output conditions corresponding to the conditions of the associated manually operable operation means for effecting through said control means the operation of said holding means to said releasing condition and the maintenance of said activating means in said inoperative condition when a fast feed, rewind or recording operation is called for and said tape means detects an end of tape condition, and maintaining said holding means in said operative condition and operating said reverse activating means to said operative condition to reverse the direction of the tape feed only when a reproducing operation is called for and said detecting means detects an end of tape condition.

4,402,020
LOCK-RELEASING MECHANISM FOR MAGNETIC RECORD/PLAYBACK APPARATUS

Tadashi Yokota, and Wataru Watanabe, both of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,836
Claims priority, application Japan, Feb. 25, 1980, 55-22366[U]
Int. Cl.³ G11B *15/18, 15/48*
U.S. Cl. 360—72.1 **3 Claims**



1. A lock-releasing mechanism for a magnetic record/-playback apparatus, which comprises:

a magnetic tape auto-reverse means;

a fast forward and fast rewind-operating means;

a plunger for actuating said auto-reverse means, said plunger being adapted to be energized for auto-reverse operation and for automatic music sensing operation and having an actuation stroke associated therewith;

a lock means for locking said fast forward and fast rewind-operating means in a fast forward and fast rewind position;

a lock-releasing means interlocked with said plunger to release the locking of the lock means upon energization of said plunger for automatic music sensing operation; and

a regulating means interlocked with said fast forward and fast rewind-operating means for restricting the actuating stroke of said plunger when energized for the automatic music sensing operation so that said auto-reverse means is kept inoperative, said fast forward and fast rewind-operating means being comprised of a fast forward operating member and a fast rewind operating member and said lock means is engageable with said operating members, said lock means including an off-member, each of said operating members having a locking cutout engageable with said roller, said regulating means including a stopper member pivotally supported on said off-member and a spring member for normally biasing said spring member to keep it in an inoperative position.

4,402,021
METHOD AND APPARATUS FOR RECORDING DIGITIZED INFORMATION ON A RECORD MEDIUM

Takenori Sonoda; Nobuhiko Watanabe, and Masato Tanaka, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,196
Claims priority, application Japan, Sep. 8, 1980, 55-109663
Int. Cl.³ G11B *15/18, 5/09*
U.S. Cl. 360—72.2 **24 Claims**

1. A method of recording at least one channel of digitized information in at least one data track on a record medium, comprising the steps of:

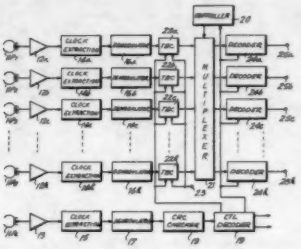
generating data blocks in response to said digitized information, each data block containing a predetermined number of data words representing said digitized information;

generating a block address for identifying each said data block, and adding said block address to the data block identified thereby;

recording successive data blocks, including the block addresses added thereto, in said at least one data track;

generating a periodic control signal during successive sector intervals, said periodic control signal including at least a synchronizing signal and a sector address; and

recording said control signal in a control track to define successive sector intervals on said record medium;

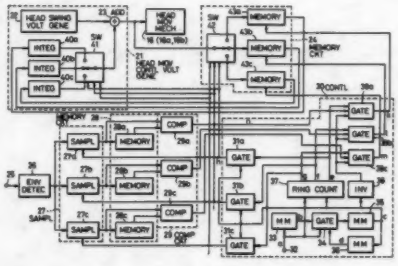


whereby a multiple of data blocks is recorded in said at least one data track during each sector interval.

4,402,022
TRACKING CONTROL SYSTEM IN A MAGNETIC REPRODUCING APPARATUS

Akira Hirota, Chigasaki, and Seisuke Hiraguri, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 14, 1981, Ser. No. 225,006
Claims priority, application Japan, Jan. 17, 1980, 55-4007
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—77 **6 Claims**



1. A tracking control system in a magnetic reproducing apparatus which comprises a rotary magnetic head for successively reproducing recorded signals from parallel tracks extending obliquely with respect to the longitudinal direction of a magnetic tape, said tracking system comprising:

head swinging means for varying the height position of said rotary magnetic head, and for swinging the tracing position of said rotary magnetic head with respect to the track on said magnetic tape, said position being displaced in the width direction of said track;

head swinging voltage generating means for generating a head swinging voltage;

one or a plurality of memory means for sampling and storing a voltage which is to be supplied to said head swinging means in order to control the height position of said rotary magnetic head, said memory means sampling the voltage at one or a plurality of sampling points at different height positions on one track along the width direction of said magnetic tape;

level detecting means for detecting the level of a signal reproduced by said rotary magnetic head at points corresponding to the sampling points of said memory means;

maximum level detecting means for detecting that said level detecting means has detected a maximum level;

controlling means for reading out the voltage stored in said memory means when said maximum level detecting means detects the maximum level; and

adding means for adding the voltage read out from said memory means and the head swinging voltage supplied from said head swinging voltage generating means, and for supplying the added voltage to said head swinging means, said maximum level detecting means comprising a memory for temporarily storing the output of said level detecting means, and a comparator means for subtracting and comparing the outputs of said level detecting means and said memory means, to detect the maximum level by inverting the polarity of the subtracted and compared result.

4,402,023

TRACKING CONTROL SYSTEM IN A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

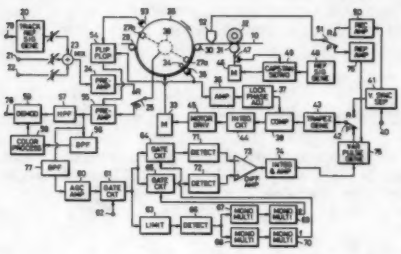
Seisuke Hiraguri, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 2, 1981, Ser. No. 239,541

Claims priority, application Japan, Feb. 28, 1980, 55-24406

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—77 **8 Claims**



1. A tracking control system in a magnetic recording and/or reproducing apparatus

said tracking control system comprising, in a recording mode:

recording means for recording an information signal on a magnetic medium by two rotary recording magnetic heads having gaps of mutually different azimuth angles, said two heads successively and alternately scanning said medium;

supplying means for supplying burst signals having a predetermined frequency together with the information signal to the recording magnetic heads so that portions of the burst signals are recorded in a main track on the magentic medium which one of the recording magnetic heads scans and in the two tracks adjacent to the main track, the two tracks being successively shifted in the longitudinal direction;

said tracking control system comprising in a reproducing mode:

reproducing means for reproducing the recorded information signal together with the burst signals from the magnetic medium by a successive scanning of said magnetic medium by two rotary reproducing magnetic heads having gaps with azimuth angles which are respectively equal to the azimuth angles of the two rotary recording heads;

separating means for separating the burst signals from the output signal of said reproducing means;

detecting means responsive to the output signal of said separating means for detecting the burst signals which are reproduced by one of the reproducing magnetic heads from the track recorded with an azimuth angle which is the same as the azimuth angle of said one of the reproducing magnetic heads and are reproduced by the other of the reproducing magnetic heads from the track recorded with an azimuth angle which is the same as the azimuth angle of the other of the reproducing magnetic heads;

extracting means responsive to the output signals of said detecting means for extracting from the output signal of said separating means the burst signals which are reproduced by said one of the reproducing magnetic heads from the tracks recorded with the azimuth angle which is different from the azimuth angle of said one of the reproducing magnetic heads and are reproduced by the other of the reproducing magnetic heads from the tracks recorded with the azimuth angle which is different from the azimuth angle of the other of the reproducing magnetic heads;

producing means responsive to the extracted burst signals from said extracting means for producing a tracking error signal; and

controlling means for controlling the relative scanning phase of the reproducing magnetic heads with respect to the track of the magnetic medium according to the tracking error signal; and

said predetermined frequency of the burst signals being such that the level of the burst signals reproduced by said one of the reproducing magnetic heads from the track recorded with an azimuth angle which is the same as the azimuth angle of said one of the reproducing magnetic heads is higher than the level of the burst signals reproduced by said one of the reproducing magnetic heads from the track recorded with the azimuth angle which is different from the azimuth angle of said one of the reproducing magnetic heads, and the level of the burst signal reproduced by the other of the reproducing magnetic heads from the track recorded with an azimuth angle which is the same as the azimuth angle of the other of the reproducing magnetic heads is higher than the level of the burst signals reproduced by the other of the reproducing magnetic heads from the track recorded with the azimuth angle which is different from the azimuth angle of the other of the reproducing magnetic heads.

4,402,024

CASSETTE HOLDER

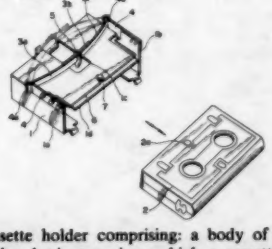
Toshikazu Kato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,376

Claims priority, application Japan, Sep. 18, 1980, 55-133610[U]

Int. Cl.³ G11B *5/008*

U.S. Cl. 360—96.5 **5 Claims**



1. A cassette holder comprising: a body of the cassette holder of the slot-in type into which a cassette is slidably loaded; a resilient member disposed in the vicinity of said body and having a toggle action such that the resilient member is biased in a large degree toward the direction of the cassette insertion when the cassette is loaded, but in a small degree toward the direction of the cassette ejection when the cassette is ejected; and an engaging pin provided to said resilient member and arranged to be engaged with the cassette so as to

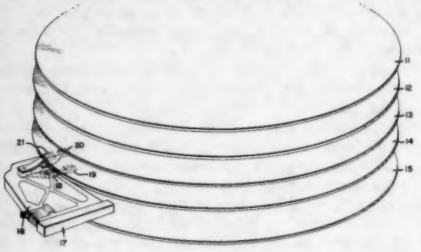
transmit the bias force from said resilient member to the cassette.

4,402,025

SERVO READ/WRITE HEAD ARM ASSEMBLY FOR MAGNETIC DISK DRIVE

Kurt M. Anderson, Louisville, and James Morehouse, Jamestown, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Oct. 17, 1980, Ser. No. 198,054
Int. Cl.³ G11B *5/60, 21/00*
U.S. Cl. 360—98 **6 Claims**



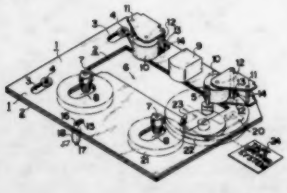
1. A magnetic disk drive comprising:
a plurality of rotating magnetic disks in a stack for storing data signals on tracks thereof, one of said disks having a group of servo tracks having position signals recorded thereon;
a plurality of data read/write head arm assemblies having data read/write heads positioned thereon in operative relation to tracks on opposing surfaces of two of said disks;
an actuator for driving said data read/write heads on said assemblies into data writing or reading relationship with said tracks;
a servo head arm assembly driven by said actuator, said servo head arm assembly having a data read/writ head and a servo head for reading said position signals positioned in operative relation to tracks on opposing surfaces of two of said disks; and
a multi-part magnetic shield on said servo head arm assembly between said last named data read/write head and said servo head to prevent interference between said data signals and said position signals.

4,402,026

MAGNETIC RECORD/PLAYBACK APPARATUS

Tadashi Yokota, and Wataru Watanabe, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,837
Claims priority, application Japan, Feb. 25, 1980, 55-22365
Int. Cl.³ G11B *5/54, 21/12*
U.S. Cl. 360—105 **8 Claims**



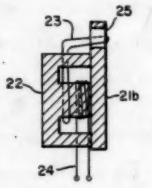
1. In a magnetic tape playback apparatus for sensing beginning-of-music cues in a cue-scanning mode, said apparatus including a tape cassette support means comprising supply and take-up reel-receiving means, and fast forward and rewind drive means selectively driving said supply or take-up reel-receiving means at a fast speed during said cue-scanning mode or for normal fast forward and fast rewind of the tape, the improvement comprising:
a head support member having a magnetic head thereon and displaceable conjointly over a given distance with said magnetic head between a first position where said head is pressed snugly against the tape for normal play to a second position where the head is pressed in light contact with the tape for cue-scanning;
tape running means including means for engaging and driving said tape at a normal play speed and movable between a first tape engaging and driving position to a second tape disengaging position where said take-up reel-receiving means is driven at a high cue-scanning speed;
a control member for controlling the position of said engaging means of said tape running means and displaceable over a distance greater than said given distance and between a first position where said tape running means is in said first tape engaging and driving position to a second position where said tape running means is in said second position disengaged from said tape; and
manually operable setting means for controlling the positions of said head support and control members and movable over a given distance from an initial playback operating position where said head support and control members are in said first positions to a cue-scanning position where said head support and control members have moved different distances into said second positions for effecting a cue-scanning mode of operation.

4,402,027

MAGNETIC TRANSDUCER WITH BUILT-IN STEP-UP TRANSFORMER

Kazuo Nakamura, Toyonaka, and Masaru Higashionji, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 18, 1981, Ser. No. 293,984
Int. Cl.³ G11B *5/20*
U.S. Cl. 360—123 **12 Claims**



1. A magnetic transducer comprising:
(a) a ring head core defining a substantially closed magnetic path, a front non-magnetic gap and an internal winding aperture;
(b) a signal winding disposed on said ring head core through said winding aperture so as to be interlinked with said closed magnetic path;
(c) a transformer core mounted at a rear plane of said ring head core, which has a central yoke, at least one peripheral yoke and a linkage yoke, with said central yoke and said peripheral yokes being magnetically connected to each other at one end by said linkage yoke and at the other end by said ring head core so as to form a shell-type transformer core;
(d) a primary winding, which is disposed about said transformer core encompassing said central yoke, and is connected to said signal winding; and
(e) a secondary winding, which is disposed about said trans-

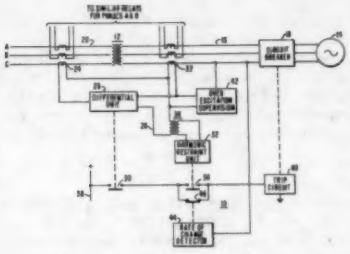
former core encompassing said central yoke in a coaxial manner with said primary winding.

4,402,028

PROTECTIVE RELAY METHODS AND APPARATUS

Eric A. Udren, Monroeville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 17, 1981, Ser. No. 293,531
Int. Cl.³ H02H 7/045
U.S. Cl. 361—36 8 Claims



1. In a protective arrangement for electrical inductive apparatus connected to a source of alternating potential via a circuit breaker, wherein the apparatus is protected by a differential current arrangement which normally can provide a trip signal for the circuit breaker only when supervised by harmonic restraint, the improvement comprising:

first means for monitoring the rate of change of the source of potential in the zone of the apparatus to be protected, and for determining whether or not harmonic restraint is required in response thereto,

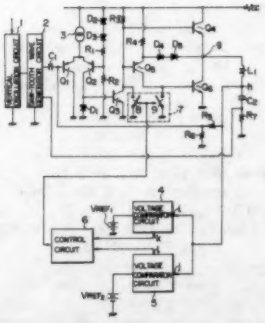
and second means responsive to said first means for enabling the differential current arrangement to provide a trip signal for the circuit breaker without harmonic restraint supervision when such supervision is not required.

4,402,029

PROTECTIVE CIRCUIT FOR OUTPUT TRANSFORMER-LESS CIRCUIT

Osamu Fujita, Chigasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 2, 1980, Ser. No. 155,745
Claims priority, application Japan, Jun. 15, 1979, 54-76142; Dec. 3, 1979, 54-157124
Int. Cl.³ H02H 7/20
U.S. Cl. 361—90 13 Claims



1. A protective circuit for preventing breakdown of at least one of output transistors of an OTL circuit, comprising:

a power supply for producing a power supply potential;

a first voltage comparator circuit having one input terminal coupled to receive an output signal of the OTL circuit and another input terminal applied with a first reference voltage which has a preselected relationship to the output signal of the OTL circuit and to the power supply potential and which produces a first comparator output signal in response to a comparison of said output signal with the first reference voltage;

a second voltage comparator circuit having one input terminal coupled to receive the output signal of the OTL circuit and another input terminal applied with a second reference voltage which has a preselected relationship to the output signal of the OTL circuit and to earth potential and which produces a second comparator output signal in response to a comparison of said outpt signal with the second reference voltage;

a control circuit responsive to the first and second comparator output signals for producing a control signal when an output of the OTL circuit is substantially coupled to the power supply potential or earth potential; and

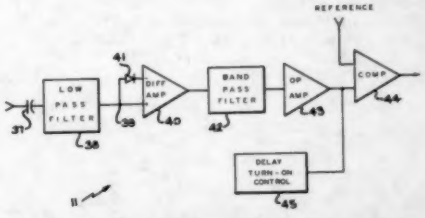
a switch circuit operable in response to the control signal for cutting off at least one of the output transistors of the OTL circuit, said switch circuit including a first switching device coupled between the base of one of the output transistors of the OTL circuit and earth potential and a second switching device coupled between the base of the other output transistor of the OTL circuit and earth potential, at least one of said first and second switching devices being rendered conductive when the output of the OTL circuit is substantially coupled to the power supply potential or earth potential, whereby said switch circuit does not affect the normal operation of the OTL circuit and is operated only when the output of the OTL circuit is substantially coupled to the power supply potential or earth potential for preventing breakdown of at least one of the output transistors of the OTL circuit.

4,402,030

ELECTROSTATIC VOLTAGE CONTROL CIRCUIT

Richard A. Moser, Toledo, Ohio; J. Thomas Schaffer, Temperance, Mich., and Richard Weinstein, Toledo, Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Feb. 19, 1982, Ser. No. 350,498
Int. Cl.³ H02H 3/08
U.S. Cl. 361—93 10 Claims



1. A control circuit for a high voltage DC power supply for an electrostatic system comprising means for generating a low voltage first signal proportional to the instantaneous high voltage current in the electrostatic system, such first signal including information on any incipient arcing condition in the electrostatic system, filter means for removing the DC component from such first signal to produce an AC second signal including the incipient arcing information, means for removing unwanted noise from such second signal to produce a third signal having a magnitude proportional to the rate of change of the high voltage current in the electrostatic system and including voltage impulses proportional to instantaneous current impulses in the high voltage electrostatic system due to incipient arcing, and means responsive to such third signal exceeding

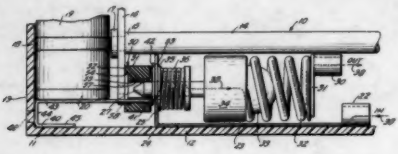
a predetermined voltage for removing high voltage from the electrostatic system prior to the occurrence of arcing.

4,402,031

GAS TUBE PROTECTOR MODULE

Michael Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,801
Int. Cl.³ H02H *9/06*
U.S. Cl. 361—124 **3 Claims**



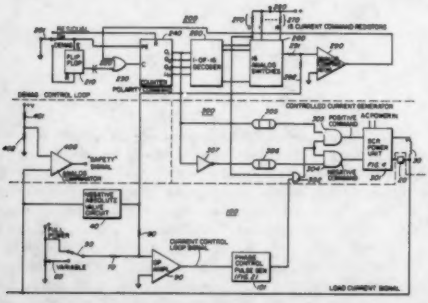
1. In a gas tube protector module for protecting a telephone circuit from excess current and voltage surges, including an insulative housing element, a pair of tip and ring contact elements, a grounding pin, a heat sensitive element, and a gas tube element; said contacts each including a pair of interconnected contact members communicating externally of said housing to a circuit to be protected, a ground pin and a transversely extending ground plate carried by said ground pin, the improvement comprising: a heat coil pin overlying said ground plate and including resilient means for urging said pin into contact with said ground plate upon operation of said heat sensitive element; an insulative spacer block interposed between said heat sensitive element and said ground plate, said block having a through bore for passage of said heat coil pin; a fixed conductor member disposed in said through bore, communicating with said heat sensitive element at a first end thereof, and being spaced a short distance at a second end thereof from said ground plate to form an air gap; and means conductively interconnecting one of said tip and ring contacts to said gas tube element and said heat sensitive element, whereby said air gap becomes operative to arc excess voltage surges upon failure of said gas tube element.

4,402,032

ELECTROMAGNET POWER SUPPLY AND DEMAGNETIZER

Bernard W. Wilterdink, Claremont, N.H., assignor to Cone-Blanchard Machine Company, Windsor, Vt.

Filed Mar. 12, 1981, Ser. No. 243,085
Int. Cl.³ H01F *13/00*
U.S. Cl. 361—145 **9 Claims**



1. In electromagnet control apparatus having a generator means for supplying direct current to the windings of an electromagnet and polarity switch means for switching the direction of said direct current on command, the improvement comprising a demagnetization system including

means for producing a current feedback signal representing the instantaneous amplitude of the current flowing through said windings,

register means for holding a digital value,

means for selecting one of a plurality of current reference levels in accordance with the value held in said register means,

comparator means for producing a control signal indicating that said current feedback signal level has attained a predetermined relationship to the selected current reference level,

means responsive to said control signal for changing the value in said register means, and

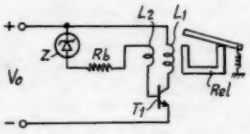
logic means responsive to a recurring first predetermined condition of the value held in said register means for operating said polarity switch means and to a final second predetermined condition of the value held in said register means for turning off said generating means.

4,402,033

SENSITIVE RELAY WITH HIGH THRESHOLD STABILITY

Ferdy Mayer, 18, rue Thiers, 38000 Grenoble, France

Filed Oct. 26, 1979, Ser. No. 88,594
Claims priority, application France, Oct. 23, 1978, 78 30442; Oct. 19, 1979, 79 14917
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—187 **5 Claims**



1. A power activation circuit for a power component comprising:

charging means controlled by an output of a switching means;

reaction means directly connected to an input control of said switching means and to a threshold element in series with said reaction means whereby there is provided by means of said threshold element a precise activation threshold so that the effective control signal of the power component is independent of the input voltage to said threshold element; and

whereby there is provided to said power component an essentially rectangular pulse whose amplitude equals the value of said input voltage when said input voltage exceeds said activation threshold of said threshold element and whose duration is determined by the parameters of said charging means and said reaction means.

4,402,034

POLARITY SENSITIVE SOLID STATE RELAY

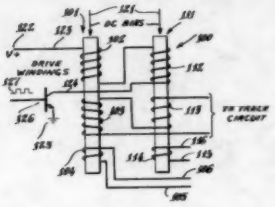
John W. Parker, Rochester, and John H. Auer, Jr., Fairport, both of N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 14, 1981, Ser. No. 301,929
Int. Cl.³ H01H *51/22*
U.S. Cl. 361—208 **27 Claims**

1. A solid state polarity sensitive relay comprising in combination:

(a) A bi-stable ferromagnetic switching module having a sensing coil for providing an output pulse in response to a flux reversal;

(b) means for producing a steady state magnetic field for biasing said module with a predetermined flux field;
(c) a first coil wound on said module for providing a flux with a first orientation in said module in response to a current in said first coil;
(d) a second coil wound on said module for providing a flux in said module in response to a current in said second coil; and



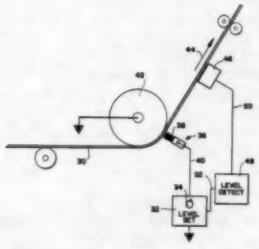
(e) a square wave control signal coupled to said first coil for effecting flux reversals in said module when a current within a predetermined range flows in said second coil; whereby
(f) with a current of a first direction in said second coil, said steady state magnetic field is aided while with a current, of a second direction opposite to said first direction, in said second coil said steady state magnetic field is opposed.

4,402,035

LOW VOLTAGE ELECTROSTATIC CHARGE REGULATING APPARATUS

Semyon Kisler, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1980, Ser. No. 183,326
Int. Cl.³ H05F *3/06*
U.S. Cl. 361—213 **12 Claims**



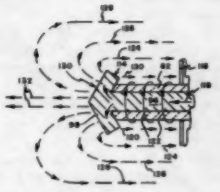
1. Apparatus for establishing a uniform dipole-type electrostatic charge on plastic dielectric materials, comprising:
a first common electrical conductor;
means for establishing an electrically conductive reference surface;
a first multiplicity of electrically conductive elongated bristles, formed of a high conductivity electrically conductive material supported over said reference surface with one end of said bristles being in an electrically coupled relation to said first common conductor, said bristles extending from their said one end toward said reference surface with the free ends of said filaments being adjacent said reference surface and with the positional relationship of said free ends approximating a row and column grid-like pattern; and
a DC potential source connected between said common electrical conductor and said reference surface, said potential source having a predetermined magnitude and polarity for establishing an intense electrostatic field and for adjusting the dipole-type electrostatic charge to the desired charge level on plastic dielectric material passed between said free bristle ends and said reference surface, and in a spaced relation from said free bristle ends.

4,402,036

METHOD OF PRODUCING A HIGH ENERGY PLASMA FOR IGNITING FUEL

George H. Hensley, Star Rte., Box 150L, Alameda, N. Mex. 87114, and Raymond E. Hensley, 3805 Garcia Northeast, Albuquerque, N. Mex. 87111

Division of Ser. No. 119,865, Feb. 8, 1980, Pat. No. 4,333,125. This application Nov. 30, 1981, Ser. No. 325,806
Int. Cl.³ F23Q *3/00*; H01T *13/00*
U.S. Cl. 361—257 **30 Claims**



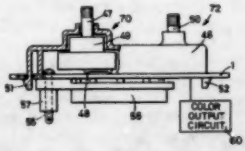
1. A method of initiating combustion of fuel, including the steps of:
(A) delivering a quantity of electrical energy from a source thereof to an area proximal to said fuel, said quantity of electrical energy being sufficient in magnitude to produce a cylindrical sheath discharge of plasma between two electrodes;
(B) temporarily storing said quantity of electrical energy at said area;
(C) producing an inverse pinch electrical discharge between said two electrodes using said stored quantity of electrical energy, said discharge including a generally cylindrical sheath of plasma circumscribing an axis of one of said electrodes;
(D) creating an electromagnetic force field around said axis; and,
(E) urging said sheath of plasma radially outward from said axis using said electromagnetic force field.

4,402,037

CATHODE-RAY TUBE SOCKET SUBSTRATE

Eiji Iwamura, and Keiichi Motoyama, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 17, 1980, Ser. No. 188,227
Int. Cl.³ H05K *7/02*
U.S. Cl. 361—423 **4 Claims**



1. A cathode-ray tube socket assembly, comprising:
(A) an insulating substrate having N through holes formed therein, N being an integer greater than 1;

(B) N electrodes provided on said subtrate, each said electrode being associated with a respective said through hole;

(C) a cathode-ray tube socket having N pin terminals and being located on a first side of said substrate, one of said pin terminals being a focus electrode pin terminal and extending through a first said through hole and being electrically connected to the electrode associated with said first through hole, each of the remaining said pin terminals being inserted into a respective one of the remaining said through holes and being electrically connected to said electrode which is associated with the said through hole through which said pin terminal extends;

(D) a color output circuit mechanically coupled to said substrate and electrically connected to at least one of said pin terminals of said cathode-ray tube socket;

and

(E) a high-voltage variable resistor provided on said insulating substrate for applying a focus voltage to said focus electrode pin terminal of said socket, said high-voltage variable resistor comprising:

(1) a center electrode electrically connected to said electrode associated with said first through hole;

(2) an arcuate film resistor defining a variable resistance part, said film resistor and said center electrode being located on a second side of said insulating substrate which is opposite said first side of said insulating substrate; and

(3) a rotary shaft provided with a slider, one part of which is in contact with said center electrode, a second part of which is in contact with and slides along said arcuate film resistor; and

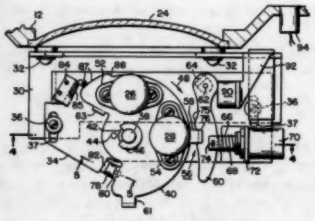
(F) an insulating casing mounted on said insulating sustrate and covering both said film resistor and said center electrode, said casing rotatably supporting said rotary shaft.

4,402,038

AUTOMATIC LAMP BULB CHANGER FOR SIGNAL LAMPS

Russell M. Hartung, Webster; Larry Appleman, Rochester, and Warren R. Alexander, Pittsford, all of N.Y., assignors to General Signal Corp., Rochester, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,079
Int. Cl.³ F21V *19/04*
U.S. Cl. 362—20 **11 Claims**



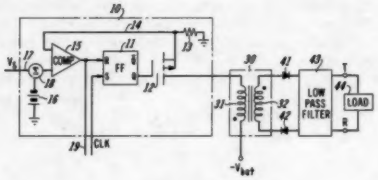
1. In a signal lamp having a housing with the lens in one side, an automatic lamp changer which comprises a turntable having an axis about which it rotates, means rotatably mounting said turntable in said housing with one side of said turntable parallel to and spaced from the axis of said lens, at least the pair of sockets for receiving lamps which when disposed in said sockets reach the optical axis of said lens, said sockets being disposed along different angularly spaced radii extending from the axis of said turntable, spring means for biasing said turntable to rotate about its axis, a latching mechanism for releasably positioning said turntable for movement between different positions having the same angular spacing as said radii and in which different ones of said lamps are aligned with said lens, said latching mechanism including at least two latch means angularly spaced from each other by said angular spacing on said turntable and defining said different angular positions, detent means releasably engagable with said latch means, and means for actuating said detent means upon failure of a lamp in at least one of said sockets which is in one of said different angular positions in which said last named lamp is positioned in alignment with said lens, and switch means operated by said turntable for making electrical connection to the other of said pair of sockets to illuminate the lamp therein upon movement of said turntable to the next of said angular positions when said lamp in said other of said sockets moves into alignment with said lens.

4,402,039

TELEPHONE LINE CIRCUIT

Howard F. Jirka, Crystal Lake, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 3, 1981, Ser. No. 299,156
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **12 Claims**



1. A power supply circuit for applying power to a load having a DC resistance comprising:

means for applying a DC voltage to said load such that a substantially fixed magnitude of DC power is supplied to said load independent of said DC resistance;

means for applying an AC voltage to said load;

feedback means coupled to said load for generating a return signal representing the voltages across said load;

filter means for separating said return signal into a DC component and an AC component;

divider means for generating a feedback signal that is substantially, directly proportional to the quotient resulting from the division of said AC component by said DC component; and

means responsive to said feedback signal for supplying an AC current to said load.

4,402,040

DISTRIBUTED BUS ARBITRATION METHOD AND APPARATUS

Ronald C. Evett, Holliston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 24, 1980, Ser. No. 190,129
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—200 **26 Claims**

22. The method of providing bus arbitration for a plurality of elements requesting simultaneous use of a synchronous common bus, comprising the steps of:

each element generating a request to occupy said common bus;

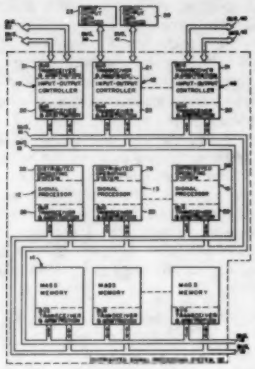
each element providing to said common bus an element arbitration code;

said common bus performing a logical-OR of each bit of a plurality of said element arbitration codes forming a composite complementary code on said bus;

each element simultaneously decoding said composite complementary code for determining if said element is a lower priority element relative to another element;

each element removing its element arbitration code from

said bus when said element has a lower priority arbitration code relative to another element supplying an arbitration code to said bus; and



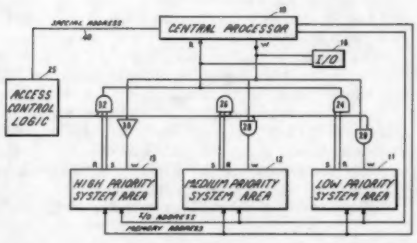
said bus arbitration composite complementary code generation and decoding sequences continuing until only a highest priority element remains on said bus.

4,402,041

PLURAL STORAGE AREAS WITH DIFFERENT PRIORITIES IN A PROCESSOR SYSTEM SEPARATED BY PROCESSOR CONTROLLED LOGIC

James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,523
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **16 Claims**



1. Apparatus for the separation of stored data in a processor system, comprising:

a central processor for processing data as retrieved from a system area as requested by said processor;

first system area means for storing therein first data of a first given priority, said first system area having a read output line coupled to said processor and a write input terminal;

second system area means for storing therein second data of a second given higher priority, said second system area having a write input line coupled to said processor and a read output terminal;

first logic means operative to couple said write input terminal of said first system area means to said processor;

second logic means operative to couple said read output terminal of said second system area means to said processor; and

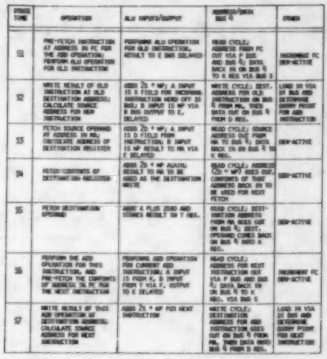
control means connected to said first and second logic means responsive to a request from said processor and operative to inhibit said first logic means and enable said second logic means when said second system area is accessed to thereby enable second data to be exclusively read and written into said second system area means, while always enabling first data to be read into said second system area means whereby said first system area means can only have written therein said first data.

4,402,042

MICROPROCESSOR SYSTEM WITH INSTRUCTION PRE-FETCH

Karl M. Guttag, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 209,914
Int. Cl.³ G06F *9/38*
U.S. Cl. 364—200 **10 Claims**



1. A method of operating a digital processor system of the type containing a microprocessor device and an addressable memory; the microprocessor device including an ALU, addressing means, and control means responsive to instruction words; comprising the steps of:

in a first time period, executing an operation in the ALU defined by a first instruction word to produce a first result while the addressing means is sending an address to said memory for a second instruction word,

in a second time period, storing said first result in the memory while decoding said second instruction word in said control means,

in a third time period, sending an address to the memory for an operand according to the second instruction word,

in a fourth time period, executing an operation in the ALU defined by the second instruction word using said operand to produce a second result while sending an address to said memory for a third instruction word, and

in a fifth time period, storing said second result in the memory while decoding said third instruction word in said control means.

4,402,043

MICROPROCESSOR WITH COMPRESSED CONTROL ROM

Karl M. Guttag; Kevin C. McDonough, both of Houston, and Gerald E. Laws, Austin, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 209,915
Int. Cl.³ G11C *7/00*
U.S. Cl. 364—200 **20 Claims**

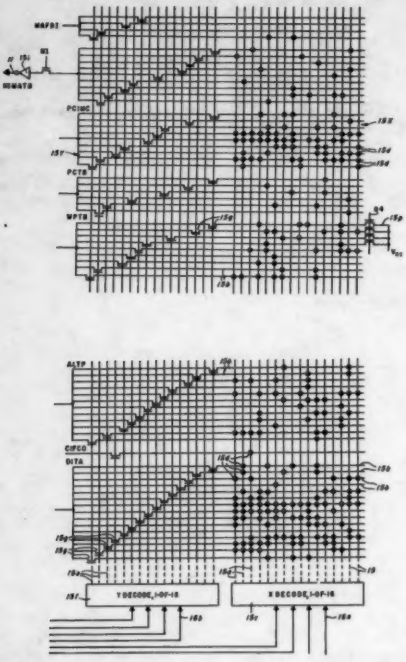
1. A decoder comprising a plurality of cell groups; each cell group including:

an array of potential cells with M rows and N columns,

first selector means for activating one of said M rows as defined by an address of B bits,

second selector means for selecting one of said N columns as defined by an address of C bits,

where M equals 2^B, and



wherein logically unneeded columns of potential cells are physically omitted from the array, whereby N is an integer substantially less than 2^C;

and the cell groups contain differing numbers N of columns.

4,402,044

MICROPROCESSOR WITH STRIP LAYOUT OF BUSSES, ALU AND REGISTERS

Kevin C. McDonough, and Karl M. Guttag, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 210,109

Int. Cl.³ G06F *1/00, 9/00;* H01L *27/00*

U.S. Cl. 364—200 **18 Claims**

14. A microprocessor device formed in a face of a semiconductor body comprising:

(a) a strip pattern on said face, the strip pattern having a length longer than its width;

(b) a control ROM on said face positioned alongside and parallel to the length of said strip pattern, the control ROM having a length longer than its width and being spaced from the strip pattern by a distance much less than the width of the strip pattern, said control ROM including an X-decoder and a Y-decoder, the Y-decoder extending along the length of a side of the control ROM facing said strip pattern, the control ROM producing a plurality of control signals at outputs from said Y-decoder, an input to the control ROM for receiving microcode addresses;

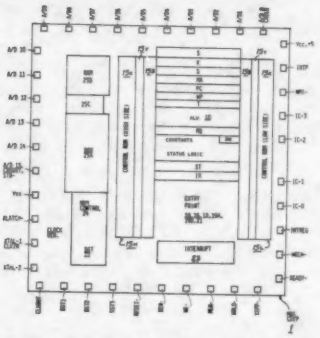
(c) said strip pattern including:

(i) an arithmetic logic unit having N bits, each bit having two data inputs and a data output and having a plurality of control means, the N bits extending in a line across the width of the strip pattern;

(ii) a plurality of registers for holding data and addresses, each register having N bits, each bit having at least one input and at least one output and having separate of control means for each such input and output, the N bits of each register extending in a line across the width of the strip pattern in one-to-one correspondence with and in alignment with the N bits of the arithmetic logic unit;

(iii) an instruction register having a plurality of bits, each bit having an input and an output and having control means for the input and output, the bits of the instruction register extending in a line across the width of the strip pattern in alignment with bits of the arithmetic logic unit and said plurality of registers;

(iv) address generating means for generating microcode addresses for coupling to said input of the control ROM, an input of such address generating means being coupled to said output of said instruction register;



(v) status storage means having a plurality of bits, each bit having at least one input and at least one output and having separate control means for each such input and output,

(vi) a plurality of busses, each bus including a set of N conductive lines, said lines extending along said face in a direction generally parallel to said length of the strip pattern; each of said bits of the arithmetic logic unit, the plurality of registers, the instruction register and the status storage means having at least one of said conductive lines extending across it and connected to the input or output thereof via said control means;

(vii) a plurality of control lines extending along said face generally perpendicular to said busses and generally parallel to the width of said strip pattern; means coupling each of said control lines to said control signals at said outputs of said control ROM; each of said control means in each of said bits of said arithmetic logic unit, of said plurality of registers, of said instruction register, and of said status storage means, being connected to a different one of said control lines.

4,402,045

MULTI-PROCESSOR COMPUTER SYSTEM

Thijs Krol, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,118

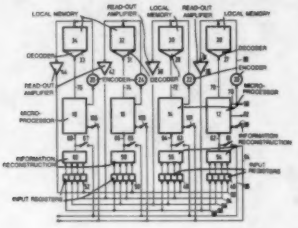
Claims priority, application Netherlands, Dec. 20, 1979, 7909178

Int. Cl.³ G06F *11/18*

U.S. Cl. 364—200 **13 Claims**

1. A multiprocessor computer system for processing data words, each word having k data symbols, said computer system comprising a plurality of n parallel operating and mutually

synchronized computer modules, each computer module including a processor module for processing the data words and having a first data input and a first data output, an encoder module fed by said first data output for receiving a processed data word and therefrom generating a code symbol on a second output, a local memory module fed by said encoder module for temporarily storing code symbols and having a third data output, and a data word reconstruction module for receiving a plurality of n code symbols for reconstructing therefrom a data word, said data word reconstruction module having a



fourth data output connected to said first data input, said multiprocessor furthermore comprising an interconnection network connecting all said third data outputs to respective second data inputs of all respective data word reconstruction modules, wherein all data symbols and code symbols consist of a plurality of b bits, wherein the respective code symbols generated from one data word constitute an n-symbol code word, the set of code words having a code distance D as defined over the code symbols of at least three, and wherein the relation between n, D and k is given by $D.k-(D-1)>n-(D-1)\geqq k\geqq 2$.

4,402,046

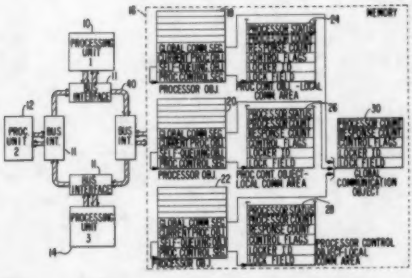
INTERPROCESSOR COMMUNICATION SYSTEM

George W. Cox, Portland, and Justin R. Rattner, Aloha, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 972,010, Dec. 21, 1978, abandoned. This application Aug. 5, 1981, Ser. No. 290,135

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **13 Claims**



1. For use in a multiprocessor system comprised of a plurality of processors and a memory shared by said processors, said plurality of processors including a sending processor and a target processor, an interprocessor communication mechanism comprising:

first means in said target processor for storing first access information, said first access information providing access to a first processor object stored in said memory, said first processor object being associated with said target processor;

second means in said sending processor for storing second access information, said second access information providing access to a second processor object stored in said memory, said second processor object being associated with one of said plurality of processors;

a communication segment stored in said memory, said communication segment including a field of control bits specifying communication functions;

each of said first and second processor objects including third access information (a communication segment access descriptor) providing access to said communication segment;

third means in said sending processor connected to said second storing means and to said memory for using said second access information to gain access to said second processor object and to said third access information (communication segment access descriptor) included therein;

fourth means in said sending processor for storing said third access information, said third access information providing access to said communication segment, in order to place a message in said communication segment, said message including said field of control bits specifying communication functions;

fifth means in said target processor connected to said first storing means and to said memory for using said first access information to gain access to said first processor object and to said third access information (communication segment access descriptor) included therein;

sixth means in said target processor for storing said third access information, said third access information providing access to said communication segment, in order to examine said control bits to thereby distinguish a function to be performed; and,

means connected between said sending processor and said target processor for signaling said target processor to thereby inform said target processor that there is a message in said communication segment;

whereby said sending processor can send a message (in the form of said field of control bits) to said target processor by utilizing said communication segment.

4,402,047

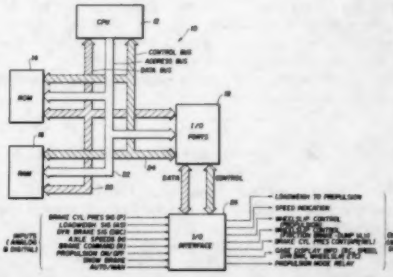
COMPUTERIZED BRAKE CONTROL SYSTEM

Ronald O. Newton, Adams; Bruce W. Shute, Henderson Harbor, and John J. Allen, Jr., Watertown, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 16, 1980, Ser. No. 216,976

Int. Cl.³ G06F *15/20*; B60T *8/00*

U.S. Cl. 364—426 **16 Claims**



1. A control system for fluid brakes of a vehicle which controls fluid pressure during operating modes of said vehicle comprising:

means for sensing the variables necessary to accurately calculate an optimum total desired brake pressure for a particular operating mode of a particular vehicle and for sensing the present brake pressure of that vehicle;

said variables including the weight and speed of that particu-

lar vehicle at that particular time as well as a commanded brake signal;

digital computer means for repeatedly calculating an optimum total desired brake pressure as a function of said sensed variables, comparing said optimum total desired braking pressure with said sensed present brake pressure, and providing control signals to the fluid brake system to cause the sensed present brake pressure to change to become substantially equal to said desired brake pressure; and

means for interfacing said digital computer and said fluid brake system for permitting said control signals to control brake system fluid pressure.

4,402,048

METHOD OF AND APPARATUS FOR INDICATING REMAINING FUEL QUANTITY FOR VEHICLES

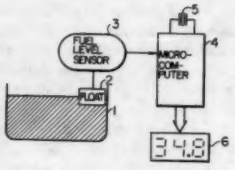
Takashi Tsuchida, Chiryu; Kazukiyo Okada, Kosai; Yutaka Okuda, Kariya; Nobuo Kondo, Anjo, and Toshio Shinohara, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 12, 1981, Ser. No. 242,823

Claims priority, application Japan, May 3, 1980, 55-58825

Int. Cl.³ G01M *15/00*

U.S. Cl. 364—442 **10 Claims**



F

1. A method for digitally computing and indicating a quantity of fuel remaining in a fuel tank of a vehicle, comprising the steps of:

detecting the quantity of fuel remaining in said fuel tank in a sampling manner;

determining a center value of the detected remaining fuel quantity values;

determining upper and lower limit values each of which is displaced in opposite directions from said center value by a predetermined amount;

replacing said upper limit value by a detected remaining fuel quantity value when the same exceeds said upper limit value and replacing said lower limit value by a detected remaining fuel quantity value when the same becomes lower than said lower limit value; and

indicating an average value of a predetermined number of said detected values.

4,402,049

HYBRID VELOCITY DERIVED HEADING REFERENCE SYSTEM

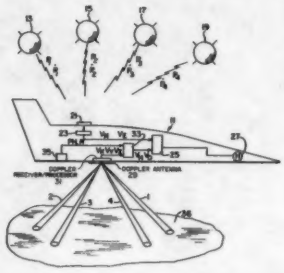
Jack Gray, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1981, Ser. No. 246,518

Int. Cl.³ G06F *15/50*; **G06G** *7/78*

U.S. Cl. 364—447 **11 Claims**

1. A vehicle navigation system including a true heading reference system for determining and controlling the position and velocity of a moveable vehicle, comprising: a receiver/-processor on said vehicle for receiving range and range rate signals from a plurality of orbiting navigational satellites and processing said signals together with the stored ephemeris information of said satellites to provide a signal representative of the vehicle's velocity with respect to the earth along the local meridian V_n, and its velocity along the local parallel of latitude, V_e, said system further comprising sensing apparatus on said vehicle for measuring and providing signals representing the vehicle's axial velocities, V_x, V_y and V_z along the roll, pitch and yaw axes thereof, a vertical gyro adapted to provide instantaneous pitch and roll signals for said vehicle, a converter unit to which said axial velocity signals and said pitch and roll signals are fed to obtain signals representing the along-



track velocity, V_h, and the cross-track velocity, V_d, of said vehicle, a velocity signal processor to which the four said velocity signals V_h, V_d, V_n, and V_e are fed, said velocity signal processor providing an output signal representative of the true heading of said vehicle from the vector relationship of said four velocity signals, and apparatus connected to said velocity signal processor for utilizing said output signal for the navigation of said vehicle.

4,402,050

APPARATUS FOR VISUALLY INDICATING CONTINUOUS TRAVEL ROUTE OF A VEHICLE

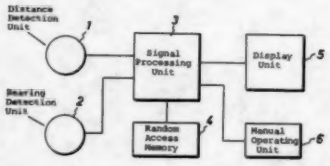
Katsutoshi Tagami, Asaki; Masao Sugimura, Niiza; Shinichiro Yasui, Wako; Tsuneo Takahashi, Saitama; Katsusuke Komuro, Chofu, and Nobuhiko Suzuki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1980, Ser. No. 208,535

Claims priority, application Japan, Nov. 24, 1979, 54-152290; Feb. 5, 1980, 55-12605

Int. Cl.³ G06F *15/50*

U.S. Cl. 364—460 **3 Claims**



1. A travel route indication apparatus for use in an automotive vehicle, comprising:

first detection means for detecting a current distance of travel of said vehicle;

second detection means for detecting a current bearing of said vehicle;

signal processing means, connected with said first and second detection means, for arithmetically obtaining a current location in terms of two-dimensional coordinates at an interval of a given unit of travel distance of the vehicle based on outputs received from said first and second detection means;

path of travel storage means, connected with said signal

processing means, for storing data on current locations in terms of two-dimensional coordinates varying from time to time as obtained from said signal processing means and for holding contents obtained as continual information on said current location of said vehicle;

display means, connected with said storage means, for displaying on a screen thereof the continuous path of travel of said vehicle from a predetermined point to a current position thereof in accordance with the data in said storage means;

said display means being adapted to visually indicate by way of an indication mark which simultaneously indicates both said current position of said vehicle and a sense or directivity to visually show a current direction of travel of said vehicle throughout a range of 360° and directly in accordance with current bearing detection signals from said second detection means;

said indication mark on said screen being updated at all times on the basis of said outputs from said second detection means;

manual operating means for setting and changing the phases of visual indication on said display means, said phases including a directivity of said indication mark, a direction of the visually-indicated path of travel of said vehicle, a shift of the position of said visual indication and a selected scale of indication; and

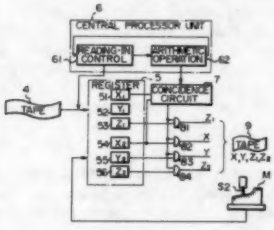
said apparatus being adapted to be installed in said vehicle so as to function as a complete and self-contained travel route indication apparatus for said vehicle.

4,402,051

METHOD FOR CARRYING OUT A CUTTING WORK IN MACHINING USING NUMERICAL DATA

Ryoichiro Nozawa, and Mitsuo Matsui, both of Tokyo, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,597
Claims priority, application Japan, Apr. 4, 1980, 55-43445
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—475 **4 Claims**



1. A method for carrying out a cutting work by machining and using desired numerical data obtained from a tracing of a model by stylus means, characterized in that:

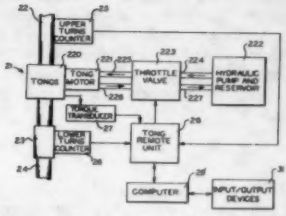
said method comprises the steps of applying a first and a second stylus to a model, producing a first and second numerical data by having said first and second styluses trace said model, obtaining the desired numerical data by applying a proportional allotment procedure to said first and second numerical data in accordance with the value of the radius of the cross-section of a cutting tool, and executing a cutting work by machining, using the above obtained desired numerical data and said cutting tool, wherein the nature of the cross-section of the first stylus, the second stylus and the cutting tool are used to position the tool.

4,402,052

APPARATUS FOR MAKING THREADED JOINTS INCORPORATING A MAKE-UP SPEED CONTROLLER

Lyndon R. Stone, San Antonio, and James D. Hall, Austin, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Apr. 10, 1981, Ser. No. 253,127
Int. Cl.³ B25B *23/14*; G01L *5/24*
U.S. Cl. 364—506 **9 Claims**



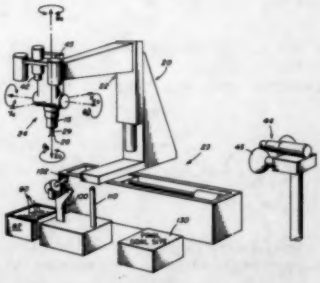
1. In an apparatus for making threaded joints from a pair of threaded members including means for rotating one of the members with respect to the other member and means responsive to the rotation of the one member for generating a pulsed actual turns signal representing actual turns made by the one member at a frequency proportional to the speed of rotation of the one member, means for generating an indication to an operator to slow down the means for rotating the one member comprising: means responsive to the actual turns signal for generating an actual turns rate signal representing a rate at which the actual turns signal pulses are being generated; means for generating a preset number signal representing a maximum pulse rate for a desired maximum speed of rotation of the one member; means responsive to said actual turns rate signal and said preset number signal for generating an output signal when said actual turns rate is greater than said maximum pulse rate; and means responsive to said output signal for generating an indication to the operator to slow down the speed of the means for rotating.

4,402,053

ESTIMATING WORKPIECE POSE USING THE FEATURE POINTS METHOD

Robert B. Kelley, Kingston; John R. Birk, Peace Dale, both of R.I., and Nai-Yung Chen, Dallas, Tex., assignors to Board of Regents for Education for the State of Rhode Island, Providence, R.I.

Filed Sep. 25, 1980, Ser. No. 190,785
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—513 **36 Claims**



8. A robot system for determining the pose of an engaged workpiece which comprises:

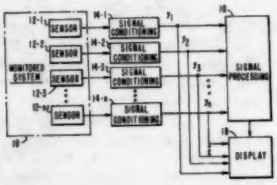
(a) a robot assembly which includes a hand to engage a workpiece and an arm to translate and rotate the hand;
(b) a video imaging device which defines line of sight optical paths to the features of the workpiece, the features being defined in images obtained in at least two presentation poses;
(c) means to store the data corresponding to the relative positions of the robot assembly and the device, and the data provided by the device; and
(d) a computer communicating with the robot assembly, the device and the means to store, which includes means to compare the images obtained and to match them to a workpiece model and to determine the six dimensional position and orientation of the workpiece and means to output data to the robot assembly to control movement of the workpiece.

4,402,054

METHOD AND APPARATUS FOR THE AUTOMATIC DIAGNOSIS OF SYSTEM MALFUNCTIONS

Robert L. Osborne, Nether Providence Township, Delaware County; Paul H. Haley, Monroeville, and Stephen J. Jennings, Radnor Township, Delaware County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1980, Ser. No. 197,319
Int. Cl.³ G06F *15/36*
U.S. Cl. 364—554 **8 Claims**



1. Apparatus for identifying possible malfunctions in an operating system subject to m malfunctions, comprising:
(a) means including sensor means for obtaining indications of operating parameters of said system, some of said indications constituting variables relevant (y_{fj}) to a particular malfunction j while others constitute non-relevant variables (y_{ij}) with respect to that malfunction;
(b) means for modifying and combining said variables relevant to a particular malfunction in accordance with a predetermined function (Fj(y_{fj})) and further modifying by a predetermined function

$$(q \in s_j f_q(y_{qj}))^m$$

of said non-relevant variables to obtain a malfunction indication (Fj(y));
(c) means for obtaining a normalized malfunction indication

$$\left(\frac{F(y)}{\sum_{j=1}^{m} F(y)}\right)$$

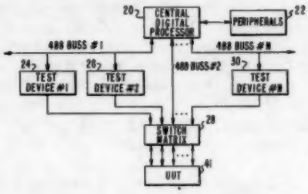
(d) means for modifying said normalized malfunction indication by a factor related to the probability that said system is not in a normal operating condition (1−Fo(y))) to obtain the probability of the occurrence of a particular malfunction (P(Mj|y)).

4,402,055

AUTOMATIC TEST SYSTEM UTILIZING INTERCHANGEABLE TEST DEVICES

Raymond A. Lloyd, Laurel; Larry L. Charles, Fallston; William F. Susie, Cockeysville; Allen W. Tate, Jr., Odenton, and James R. Reeder, Timonium, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1981, Ser. No. 229,029
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—579 **9 Claims**



1. A test system, comprising in combination:
a. a central programmable digital processor for accepting a test program in a first high level compiler language, said program comprising a plurality of program sequences each specifying a test to be performed on a unit under test;
b. a plurality of test devices each including a programmable processor and at least one test instrument coupled to communicate with said programmable digital processor via a data bus using a compacted (i.e. simplified version) of said high-level compiler language;
c. a switch matrix coupled to receive switching commands from said programmable digital processor via a data bus and the data input/output line from said test devices; wherein
d. each sequence of said program in said first high level compiler language specifying a test to be performed is compacted by said programmable digital processor to produce program sequences in said compact version of said first high level compiler language with portions of said program sequences in said compact version of said high level compiler language relating to one of said test instrument being coupled to said programmable processor comprising a portion of at least one of said plurality of test devices which in response thereto generates the signals required by said at least one test instrument to perform the specified test and to said switch matrix to couple said at least one test instrument to said apparatus to be tested.

4,402,056

ELECTRONIC DIGITAL MEMORANDUM

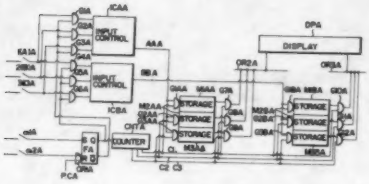
Ichiro Sado; Juji Kishimoto, both of Tokyo, and Hiroshi Murata, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 7,842, Jan. 30, 1979, abandoned. This application May 8, 1981, Ser. No. 261,965
Claims priority, application Japan, Jan. 31, 1978, 53-9667; Feb. 1, 1978, 53-10299; Feb. 3, 1978, 53-11288; Feb. 15, 1978, 53-16759; Feb. 22, 1978, 53-22090[U]; Feb. 27, 1978, 53-21767; Feb. 28, 1978, 53-25830[U]; Feb. 28, 1978, 53-25831[U]; Mar. 9, 1978, 53-27047
Int. Cl.³ G06F *15/20, 3/14*
U.S. Cl. 364—705 **5 Claims**

1. An information processing apparatus comprising:
input means for entering information and retrieval instructions;
storage means for storing data items each consisting of address information entered as memory addresses and data information associated with the address information, respectively;
first retrieving means connected to said input means and said

storage means for retrieving the data item stored in said storage means in such a way that it retrieves the address information coincident with a retrieving address information entered from said input means to derive the data information associated with the retrieved address information;

second retrieving means connected to said input means and said storage means for retrieving the data item stored in said storage means in such a way that when said first



retrieving means did not retrieve the stored address information coincident with a retrieving address information entered from said input means, it retrieves the stored address information most near the retrieving address information entered from said input means and derives the data information associated with the retrieved address information; and

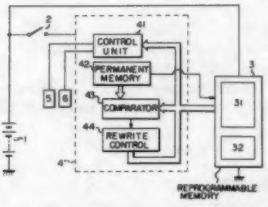
means for visualizing the data information derived from said first or second retrieving means.

4,402,057

METHOD OF AND APPARATUS FOR ENSURING CORRECT OPERATION OF A MICROCOMPUTER IN THE EVENT OF POWER OUTAGE

Tomio Itou, and Masanori Mizote, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 5, 1979, Ser. No. 1,168
Claims priority, application Japan, Jan. 11, 1978, 53/1680
Int. Cl.³ G06F *7/00, 11/00, 11/16*
U.S. Cl. 364—900 **12 Claims**



1. A method of operating a microcomputer provided with nonvolatile storage means storing a check data signal and read/write volatile storage means of the type that store bit values only while power is supplied thereto, said method enabling the volatile storage means to be tested to determine if the contents thereof have changed in response to power not being supplied thereto, the check data enabling the volatile storage means to be checked to determine if data stored therein has changed as a result of power not being supplied thereto, comprising

storing the check data signal in an allocated portion of said read/write storage means and storing in the remaining portion of said read/write storage means other data needed to perform computer functions,

detecting a match or mismatch between the check data signal stored in said nonvolatile storage means and the data signal stored in said allocated portion of said read/write storage means each time power is applied to the microcomputer,

setting all bits stored in said remaining portion of said read/write storage means to a predetermined state and writing said check data signal stored in said nonvolatile storage means into said allocated portion of said read/write storage means in response to a mismatch being detected, and

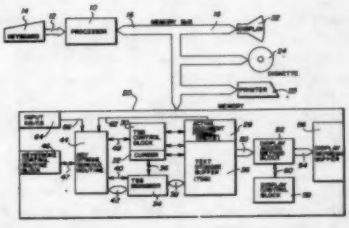
operating said microcomputer in accordance with the normal computer functions thereof using data stored in said remaining portion of said read/write storage means in response to a match being detected between the stored check data in said nonvolatile storage means and the data signal stored in said allocated portion of said read/write storage means.

4,402,058

KEYBOARD MISMATCH CORRECTION

John A. Aiken, Jr., Round Rock, and Kenneth O. Shipp, Jr., Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,788
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **5 Claims**



1. In a word processor where a text stream input by way of the keyboard is stored and displayed to an operator and wherein different keyboard character sets are available for use, the combination which comprises:

means for signalling the location at which an insert character is to be added to said text stream, said insert character belonging to an input keyboard character set defined by an input keyboard character set code;

means for comparing said input keyboard character set code with an active keyboard character set code identifying an active keyboard character set employed to produce said text stream immediately preceding said location to produce a first output when said character keyboard set codes are the same and a second output when said character keyboard set codes are not the same;

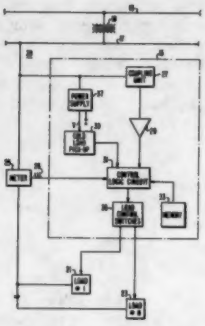
means for entering said insert character at said location in response to said first output; and

means responsive to said second output for adding a character set change code immediately upstream of said location in said text stream to indicate the keyboard character set for said insert character at said location, for entering said insert at said location, and for adding a character set change code immediately downstream of said insert in said text stream for defining the keyboard character set to be used to produce the text stream subsequent to said insert.

4,402,059
LOAD MANAGEMENT TERMINAL

Jerry M. Kennon, and John S. Phillips, both of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1981, Ser. No. 252,685
Int. Cl.[3] G01R 21/00
U.S. Cl. 364—900 5 Claims



1. A microprocessor based load management terminal, said load management terminal being a component in a power distribution system for delivering electrical power and carrying information, said load management terminal comprising:

a power line coupling unit connecting said load management terminal to the power distribution system;

a signal receiver and conditioning unit producing a command signal in response to said power line coupling unit;

control logic means performing load management functions in response to said command signal;

a power supply producing supply voltages for said load management terminal;

a plurality of load control switches each selectably connecting a load to said power distribution system in response to said control logic means; and

a cold load pick-up monitoring one of said supply voltages, said cold load pick-up producing an output signal responsive to power outages, said output signal input to said control logic means such that said load is disconnected in response to said cold load pick-up;

said loads being disconnected by said control logic means in response to a said cold load pick-up output signal for a predetermined shed time plus a randomly generated shed time such that said loads are reconnected to the power distribution system at different times.

4,402,060
GAP TOLERANT MERGE ELEMENT FOR CONTIGUOUS-DISK BUBBLE DEVICES

John S. Best, San Jose, and Ian L. Sanders, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

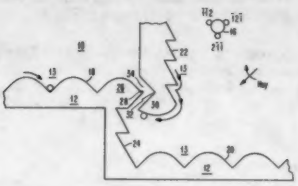
Filed Jul. 27, 1981, Ser. No. 287,337
Int. Cl.[3] G11C 19/00
U.S. Cl. 365—36 7 Claims

1. A merge element for ion-implanted bubble devices comprising

bubble domain supporting material having ion-implanted and non ion-implanted regions, said material having three crystallographic axes of symmetry in the plane of the material,

a first input track with a tip portion,

a second input track with a cusp portion substantially facing said tip portion to form a gap therebetween adapted to be a merge region, said cusp portion oriented such that a line bisecting the angle making said cusp is perpendicular to one of said three axes, said cusp portion having edges that are substantially parallel to said tip portion, and

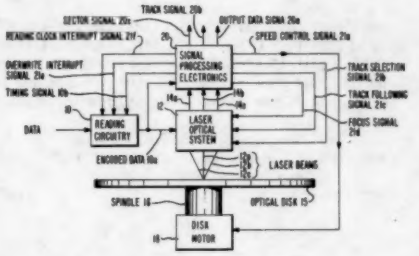


an output track associated with said merge region wherein bubbles from said first and second input tracks merge and propagate on said outp it track.

4,402,061
PREFORMATTED OPTICAL MEDIA FOR USE IN AN OPTICAL MEMORY SYSTEM

Robert L. Hazel, Thousand Oaks, and Edward V. LaBudde, Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 15, 1981, Ser. No. 311,628
Int. Cl.[3] G11C 13/04
U.S. Cl. 365—127 14 Claims



1. A preformatted record member for use in an optical data system in which a radiation beam of predetermined frequency is focused on said member and relative movement is provided between said record member and said beam, said record member comprising:

a supporting substrate having a planar surface; and

a plurality of layers disposed on the planar surface of said substrate providing a plurality of optical holes constituting a predetermined formatting pattern for said record member;

said substrate and layers being constructed and arranged so that an optical hole exhibits a reflectivity at said predetermined frequency which is significantly different from the reflectivity exhibited by a portion of said record member where no optical hole is provided;

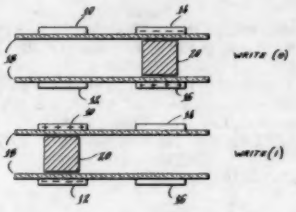
said predetermined formatting pattern being such as to represent at least one track having a plurality of headers positioned at predetermined locations along the track, each header comprising a plurality of optical holes arranged in a predetermined manner;

each header including a first pattern of optical holes disposed on the track so that traversal thereof by said beam produces a reflected beam having an intensity which is dependent on the quality of focusing of the beam on the track.

4,402,062
METHOD AND APPARATUS FOR DIELECTROPHORETIC STORAGE AND RETRIEVAL OF INFORMATION

J. Samuel Batchelder, 85 Allison Rd., Katonak, N.Y. 10536

Filed May 14, 1981, Ser. No. 263,355
Int. Cl.³ G11C *11/42*
U.S. Cl. 365—153 15 Claims



13. A method of storing and retrieving information comprising the steps of:

providing first and second electrically neutral materials having different dielectric constants within a housing,

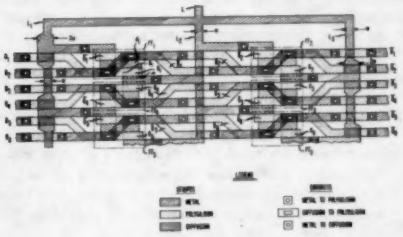
applying a non-uniform electrical field to said materials to vary the relative position of said materials within said housing as a result of dielectrophoretic forces resultant from said applied non-uniform electrical field, the position of one of said materials within the housing corresponding to stored information, and

detecting the position of said one material within said housing to retrieve said stored information.

4,402,063
FLIP-FLOP DETECTOR ARRAY FOR MINIMUM GEOMETRY SEMICONDUCTOR MEMORY APPARATUS

Norman C. Wittwer, Oldwick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 28, 1981, Ser. No. 306,217
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 12 Claims

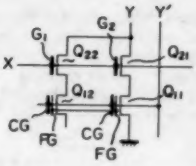


1. An integrated circuit semiconductor memory apparatus comprising a plurality of first bit lines (B_j) for accessing a first memory array and an equal plurality of second, complementary bit lines ($\overline{B}_j$) for a second memory array, an equal plurality of flip-flop detectors (FF_j) each of such flip-flops (FF_j) having a separate pair of input detecting terminals one of which is connected to a corresponding first bit line (B_j) and the other of which is connected to a corresponding complementary bit line ($\overline{B}_j$), and each of such flip-flops (FF_j) having a latching terminal connected to a common latching terminal (LT) through bus line connecting means for latching such flip-flops (FF_j) characterized in that said bus line connecting means comprises first, second, and third electrically parallel conductive column latching lines (L_1, L_2, L_3), the flip-flops FF_j satisfying $j=4i+1$ and $4i+4$, where i is 0 or a positive integer, comprising a separate cross-coupled pair of first and second MOSFETs (Q_j and $Q_{\overline{j}}$) located between the first and second latching lines (L_1, L_2), and the flip-flops FF_j satisfying $j=4i+2$ and $4i+3$ comprising a separate cross-coupled pair of third and fourth MOSFETs (Q_j and $Q_{\overline{j}}$) located between the second and third latching lines (L_2, L_3), the corresponding pair of gate electrodes of every such pair of MOSFETs (Q_j and $Q_{\overline{j}}$) serving as the pair of input detecting terminals for the corresponding flip-flop (FF_j).

4,402,064
NONVOLATILE MEMORY

Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 25, 1981, Ser. No. 324,686
Claims priority, application Japan, Nov. 26, 1980, 55-166355
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—185 11 Claims



1. A nonvolatile memory comprising:

a plurality of memory cells;

a plurality of intersecting column lines, row lines and program lines connected to the memory cells, each of the memory cells comprising:

a selecting transistor; and

a programming transistor connected in series with said selecting transistor,

said programming transistor including a control gate and a floating gate,

said selecting transistor having a drain connected to one of the column lines, and having a gate connected to one of the row lines,

said programming transistor having a control gate connected to one of the program lines,

said selecting transistor being divided into first and second selecting transistors,

said programming transistor being divided into a read transistor, having a floating gate provided with a relatively thick insulation layer thereunder, and a write-erase transistor having a floating gate provided partially with a relatively thin insulation layer thereunder,

said first selecting transistor and said read transistor being connected in series, and the second selecting transistor and said write-erase transistor being connected in series.

4,402,065
INTEGRATED RAM/EAROM MEMORY SYSTEM

David L. Taylor, Carrollton, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 11, 1981, Ser. No. 242,658
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 10 Claims

1. A memory system integrated on a single chip having a system input and output comprising:

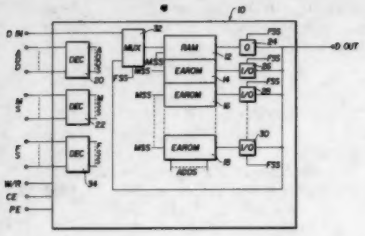
a random access memory unit having an input connected to the system input and an output connected to the system output;

a plurality of alterable read only memory units having inputs and outputs;

first means for interconnecting the output of said random

access memory unit to the inputs of said alterable read only memory units;

second means for interconnecting the outputs of said alterable read only memory units to the input of said random access memory unit; and



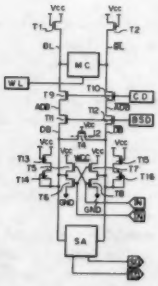
select means coupled to said first and second means for selecting the output of said random access memory unit as the input for one of said alterable read only memories or selecting the output of one of said alterable read only memories as the input for said random access memory.

4,402,066

SEMICONDUCTOR MEMORY CIRCUIT

Hideo Itoh, Kawasaki, and Hiroshi Shimada, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 17, 1981, Ser. No. 234,716
Claims priority, application Japan, Feb. 16, 1980, 55-18019
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 **11 Claims**



1. A semiconductor memory circuit comprising:

a plurality of first common line and second common line pairs, each of said first and second common lines including at least a bit line and a data bus connected in series;

a plurality of static RAM type memory cells, each cell absorbing a fixed current, having a read cycle, a write cycle, and being connected between a corresponding one of said bit line pairs;

a write-control circuit connected between each of said data bus pairs;

a sense amplifier connected between each of said data bus pairs, for producing read data responsive to data sensed from each of said data bus pairs; and

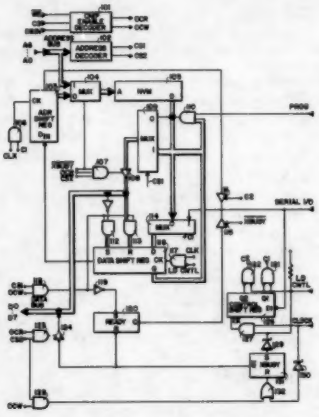
a plurality of bypassing transistors operatively connected between the corresponding first and second common lines of respective said pairs thereof, for conducting bypassing current between said corresponding first and second common lines of the respective said pairs such that said bypassing current is less than said fixed current, each of said bypassing transistors being continuously conductive at least during said read cycle.

4,402,067

BIDIRECTIONAL DUAL PORT SERIALLY CONTROLLED PROGRAMMABLE READ-ONLY MEMORY

William E. Moss, 510 Humber Ct.; Shlomo Waser, 514 Humber Ct., both of Sunnyvale, Calif. 94086, and Ury Priel, 21776 Collingsworth, Cupertino, Calif. 95014

Filed Feb. 21, 1978, Ser. No. 880,007
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—219 **22 Claims**



1. A bidirectional dual port serially controlled electronically programmable read-only memory comprising, in combination:

means for receiving a plurality of control input signals;

serial input/output port means for transmitting data to and receiving data from said read-only memory in serial form;

plural bit address bus means providing parallel addressing information;

plural bit bidirectional parallel data bus means for transmitting and receiving data in parallel form;

register means for temporary storage of address and data information, said register means coupled to said serial input/output port means for providing serial output data and coupled to said data bus means for providing parallel output data;

multiplexing means coupled to said register means, said address bus means, said data bus means and said serial input/output port means for selectively switching data;

control means responsive to said control input signals and coupled to said register means, said address bus means, said serial input/output port means and said multiplexing means for controlling the interaction of said register means, said multiplexing means, said address bus means, said data bus means, and said serial input/output port means;

nonvolatile memory means coupled to said multiplexing means for producing a plural bit data output; and

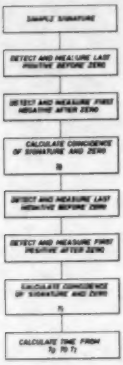
means for permanently storing in a portion of said nonvolatile memory means data contained in said register means, said portion determined by said multiplexing means.

4,402,068

METHOD AND APPARATUS FOR ACOUSTIC WELL LOGGING

Jorg A. Angehrn, Houston, Tex., assignor to Dresser Industries Inc., Dallas, Tex.

Division of Ser. No. 30,049, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 949,592, Oct. 10, 1978. This application Aug. 31, 1981, Ser. No. 297,662
Int. Cl.³ G01V 1/40, 1/24
U.S. Cl. 367—26 4 Claims


SAMPLE SIGNATURE
DETECT AND MEASURE LAST NEGATIVE BEFORE ZERO
DETECT AND MEASURE FIRST NEGATIVE AFTER ZERO
CALCULATE COINCIDENCE OF SIGNATURE AND ZERO
DETECT AND MEASURE LAST NEGATIVE BEFORE ZERO
DETECT AND MEASURE FIRST NEGATIVE AFTER ZERO
CALCULATE COINCIDENCE OF SIGNATURE AND ZERO
CALCULATE TIME FROM

1. Method for determining the velocity of acoustic energy within a predetermined distance of earth materials traversed by a borehole, comprising the steps of:

generating acoustic energy at a location within the borehole;

detecting acoustic energy at a preselected distance from said acoustic energy generation and producing an electrical representation of said detected acoustic energy;

converting said electrical representation into a digital representation of said detected acoustic energy;

determining from said digital representation a first point functionally related to said generation of acoustic energy and a second point functionally related to said detection of acoustic energy;

measuring the time interval between said first and said second points to yield an indication of the velocity of said acoustic energy over said predetermined distance; and

generating a noise immunity gate interval dependent upon said travel time, said noise immunity gate interval having a variable time duration from said first point and a fixed time duration from said second point.

4,402,069

ACOUSTIC ENVELOPE HAVING MINIMAL VIBRATION AND FLOW INDUCED NOISES

Howard A. Miller, Encinitas, and Charles S. Nichols, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1981, Ser. No. 270,061
Int. Cl.³ H04R 1/44
U.S. Cl. 367—154 10 Claims

1. A towed line sonar array comprising:

elongated conducting means;

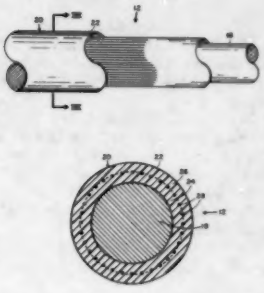
only one tubular sheath;

said one tubular sheath being mounted in an engaging relationship about and along the elongated conducting means;

the tubular sheath having inner and outer tubular portions which are integral with respect to one another;

a plurality of non-elastic strands extending longitudinally along the sheath between the inner and outer tubular portions and being bonded thereto; and

the sheath being a material with a Youngs modulus of elasticity from two times 10^7 to one times 10^8 Pascals and a damping factor greater than 0.4 in a frequency range from 11 Hz to 110 Hz and in a temperature range from 0° to 20° C. so that the sheath has high radial compliance and high acoustic damping properties.

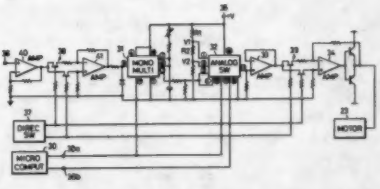


4,402,070

TRANSFER CONTROL DEVICE FOR A REPRODUCING TRANSDUCER IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara; Isami Kaneda, Yokohama; Susumu Sakakibara, Sagamihara; Ryozo Abe, Yokohama, and Yasushi Sano, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 11, 1981, Ser. No. 301,212
Claims priority, application Japan, Sep. 12, 1980, 55-126887
Int. Cl.³ H04N 5/76; G11B 3/10, 21/02
U.S. Cl. 369—43 6 Claims



1. A transfer control device for a reproducing transducer in a rotary recording medium reproducing apparatus having a reproducing transducer for reproducing recorded signals from a rotary recording medium and a driving motor for transferring said reproducing transducer on said rotary recording medium, said transfer control device comprising: a micro-computer having first and second output ports, said first

output port producing a signal of a pulse form which repeats high-level and low level periods during a normal-speed transferring mode, said second output port producing a continuous high-level or low-level signal according to the transferring mode so that predetermined combinations of high and low level signals are obtained from the first and second output ports;

a square wave signal generating circuit applied with the output signal from said first output port of said micro-computer, said square wave signal generating circuit being triggered to produce a predetermined square wave signal when applied with said signal of a pulse form and not triggered when applied with other signals of constant level; and

a switching circuit applied with the output signals from said first and second output ports of said micro-computer, to switch over a plurality of input terminals according to the levels of the applied signals and pass the input terminal

voltage through to an output side as an output voltage, said switching circuit supplying the output voltage thus obtained to said driving motor.

4,402,071

STATIONARY RECORD PLAYER

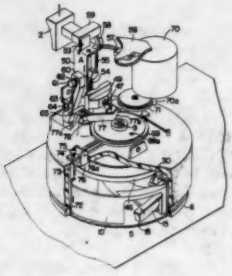
Yasushi Okamura, and Kiichiro Tanaka, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 136,827, Apr. 3, 1980, Pat. No. 4,332,023, which is a division of Ser. No. 952,389, Oct. 18, 1978, Pat. No. 4,232,868. This application Aug. 17, 1981, Ser. No. 293,138

Claims priority, application Japan, Oct. 19, 1977, 52-126266; Oct. 19, 1977, 52-126267; Oct. 19, 1977, 52-126268; Feb. 20, 1978, 53-18963; Mar. 6, 1978, 53-25568; Mar. 23, 1978, 53-33864; Mar. 24, 1978, 53-34455

Int. Cl.³ G11B *3/00, 3/12*

U.S. Cl. 369—67 **1 Claim**



1. A stationary record player having a record guide for engaging the periphery of a record disc provided on a carrier plate, a turn table disposed in said record guide, a pickup means attached to said turn table for tracing the recording groove of a record medium; a power train including a motor and pulley assembly for rotating said turn table, further comprising:

(a) a detecting member disposed between said record guide and said turn table for providing a linear vertical movement when said record guide is in contact with said record medium;

(b) a float disc mounted vertically movable beneath and coaxial with a pulley of said assembly, said float disc having a projection for engaging an aperture in said pulley; said float disc being vertically raised by said detecting member in the absence of a record disc in engagement with said record guide, whereby said projection extends through said pulley;

(c) means for inhibiting the driving of said turn table, said means having an actuating arm disposed above said pulley for contacting said projection extending through said pulley whereby said turn table is stopped from rotating when said projection is not in said aperture; and

(d) means for positioning said pickup into a non-engaging position above said record track in response to the contacting of said projection with said actuating arm.

4,402,072

VIDEO DISC MASTERING USING GIMBALLED AIR PUCK

Joseph Guarracini, Lawrenceville, and Joseph L. Valentine, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1981, Ser. No. 258,758

Int. Cl.³ G11B *3/10*

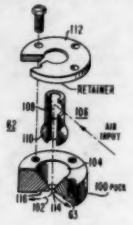
U.S. Cl. 369—132 **16 Claims**

1. Apparatus for recording information signals in a substrate comprising:

means for recording variations representative of said information signals on a surface of said substrate;

means for establishing relative motion between said recording means and said substrate;

means for providing a column of gas for supporting said apparatus at a given dimension above said surface of said



substrate when said substrate is in a working position, said gas providing means including a gas delivery puck; and

gimbal means for supporting said gas delivery puck such that said gas delivery puck swivels to allow a flat lower surface of said gas delivery puck to follow the surface contour of said substrate as said substrate surface undulates during the occurrence of said relative motion.

4,402,073

SPEECH AND DATA COMMUNICATION NETWORK

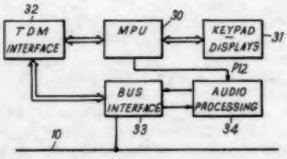
Gerald C. Hammond, Nuneaton, England, assignor to Vanderhoff Communications Ltd., Warwickshire, England

Filed Mar. 10, 1981, Ser. No. 242,338

Claims priority, application United Kingdom, Mar. 11, 1980, 8008232

Int. Cl.³ H04J *3/02, 6/00, 9/00*

U.S. Cl. 370—9 **10 Claims**

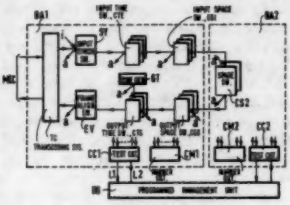


1. A speech and data communication network comprising a two-wire bus, a source of synchronizing pulses connected to the bus, the pulses marking off TDM cycles comprising interleaved time slots, including a control time slot and a plurality of working time slots, a plurality of devices connected to the bus and each including (1) a microprocessor capable of generating and feeding control data pulses into the control time slot, and of responding to data pulses in the control time slot, to establish a channel between a calling device and a called device by selecting a free working time slot, (2) audio processing means for sampling an audio signal and analogue modulating pulses in accordance with the samples to transmit the audio signal, the audio processing means further responding to received analogue modulated pulses to demodulate the audio signal, and (3) a bus interface enabled to transmit or receive the sampled audio signal in the form of analogue modulated pulses in a selected time slot, and wherein the microprocessor is arranged to transmit digital message data by binary modulation of the analog modulated pulses in a selected time slot and to receive digital message data as binary modulated pulses in a selected time slot, whereby the bit value of the digital message data is represented by the absence of pulses.

4,402,074
SWITCHING NETWORK TEST SYSTEM

Bernard Cupuis, Maurepas, and Jacques Thiaud, Versailles, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 14, 1980, Ser. No. 196,978
Claims priority, application France, Oct. 12, 1979, 79 25475
Int. Cl.³ H04J 3/00; H04Q 11/04
U.S. Cl. 370—14 **9 Claims**



1. In a test system for a time-division switching network, said time division switching network being subdivided into subsystems, in an exchange controlled by central computers through a plurality of programmed management units relaying commands between said subsystems and said computers, said test system having means for retrieving samples from a plurality of predetermined test points in said switching network and for injecting samples at inputs of said network, said retrieving means and said injecting means being controlled by said central computers through said programmed management units, the improvement comprising, in said means for injecting and retrieving:

means for interchanging messages with a predetermined one of said management units through input and output serial links;

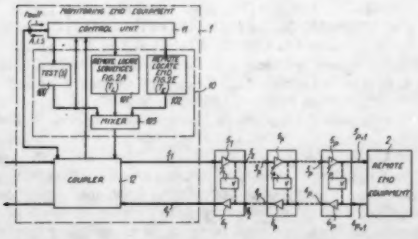
selection control means for controlling sample retrieval and injection in said subsystems according to messages received by said means for interchanging messages; and

synchronizing means for synchronizing said injecting and retrieving means for synchronizing injection and retrieval of samples and for sending messages to said management unit via said message interchanging means.

4,402,075
STEP-BY-STEP REMOTE LOCATING SYSTEM FOR REPEATERS IN A PCM LINK

Gilbert L. Bargeton, Paris, and Claude P. Beynie, La Varenne, both of France, assignors to Societe Anonyme de Tele Communication, Paris, France

Filed Jun. 25, 1981, Ser. No. 277,101
Claims priority, application France, Jul. 2, 1980, 80 14769
Int. Cl.³ H04B 3/46
U.S. Cl. 370—15 **15 Claims**



1. A system for step-by-step remote locating pairs of first and second amplifying means respectively included in first and second transmission channels of a bidirectional digital transmission medium between first and second end means,

said first end means comprising first generating means for generating on said first channel remote locate sequences composed of first interruptions in a digital signal conveyed by said first channel, and second generating means for generating a locate end interruption in said digital signal on said first channel,

each interruption being longer than the duration of the maximum series of consecutive zero digits that said digital signal can contain and each of said first interruptions being shorter than said locate end interruption,

each of said remote locate sequences being intended to command closing of a loop-back path between said first and second amplifying means of a respective pair and comprising (a) a predetermined integral number k ($k \geq 2$) of first nonconsecutive interruptions during a predetermined period of time and, (b) with the exception of the first sequence generated and intended to command the nearest amplifying means pair of said first end means, an interruption which precedes said first interruptions of said sequence and which is intended for opening said loop-back path of the preceding amplifying means pair,

each pair of amplifying means being associated with switching means for closing and opening the respective loop-back path of said amplifying means pair,

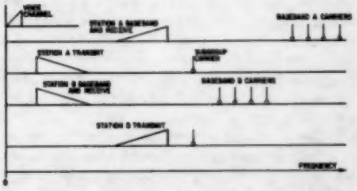
detecting means for detecting said locate end interruption, and

detecting and counting means for detecting and counting said first interruptions thereby controlling said switching means in the closed loop-back path position when the count of said detecting and counting means is equal to k, and in the opened loop-back path position when the count of said detecting and counting means is different from k, said detecting and counting means automatically returning to zero in response to a count less than k during said predetermined period of time or in response to a locate end interruption under the control of said detecting means.

4,402,076
TWO WIRE F.D. MULTIPLEX SYSTEM

Zdzislaw A. A. Krajewski, Ajax, Canada, assignor to Bayly Engineering Limited, Ajax, Canada

Filed Jan. 5, 1981, Ser. No. 222,904
Claims priority, application Canada, May 15, 1980, 352009
Int. Cl.³ H04L 5/14
U.S. Cl. 370—30 **8 Claims**



1. A two-wire frequency division multiplex system comprising first and second kinds of multiplex stations connected by two-wire lines, and distinguished by means to both produce and to receive a predetermined one of two different predetermined frequency basebands each of which consists of predetermined frequencies for dividing the multiplex channels, said first kind of multiplex stations including transmit means having conversion means to convert their own basebands to the different basebands of the second kind of multiplex stations and vice-versa.

4,402,077

DUAL RAIL TIME AND CONTROL UNIT FOR A DUPLEX T-S-T-DIGITAL SWITCHING SYSTEM

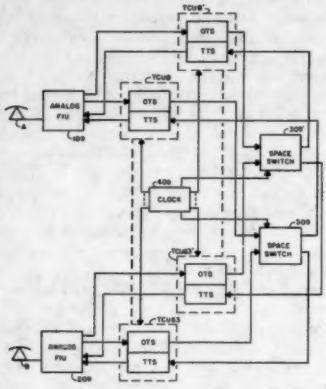
Nathaniel Simmons; Stig Magnusson, both of Phoenix; Sergio E. Puccini, Scottsdale, all of Ariz.; Donald W. McLaughlin, Naperville, and David J. Stelte, Lombard, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 23, 1980, Ser. No. 219,546

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—63 **10 Claims**



1. In a duplex time-space-time switching system including first and second parallel switching networks, said switching system transmitting a plurality of PCM voice samples over each of said first and second switching networks from a first to a second telephone subscriber via subscriber interface equipment, each of said subscribers being connected to each of said first and second parallel switching networks, said switching system comprising:

synchronization means;

each of said parallel switching networks including:

first and second buses connected to said subscriber interface equipment;

first and second space switching means connected to said synchronization means;

first and second terminating time switching means connected respectively between said first and second space switching means and said subscriber interface equipment;

first and second originating time switching means connected respectively, between said first and said second buses and said first and second space switching means and each said originating time switching means further connected to said synchronization means, each of said originating time switching means operated to switch said PCM voice samples from said subscriber interface equipment to said first and second space switching means, said first and second originating time switching means being interconnected;

each of said originating time switching means including:

first and second memory means connected to each of said first and second buses, said first and said second memory means being interconnected so that said first and said second memory means are written into simultaneously in sequential time slots with said transmitted PCM samples;

said first and said second memory means capable of being operated so that said PCM samples transmitted on said first bus are switched through said second space switching means to said second terminating time switching means or so that said PCM samples transmitted on said second bus are switched through said first space switching means to said first terminating time switching means;

each of said parallel switching networks further including:

said first and second terminating time switching means respectively operated to switch said PCM voice samples from said first and second space switching means to said subscriber interface equipment for transmission to said second telephone subscriber, said first and second terminating time switching means being interconnected;

each of said terminating time switching means including:

first and second memory means each connected between said first and second space switching means and said subscriber interface equipment, said first and said second memory means being interconnected so that said first and said second memory means are written into simultaneously in corresponding time slots for storing said PCM samples transmitted from said space switching means;

a plurality of buses connected between each of said memory means of said terminating time switching means and said subscriber interface equipment for transmitting said PCM samples to said subscriber interface equipment;

gating means connected respectively between said first and second space switching means and each of said memory means of said first and second terminating time switching means, each of said gating means operated in response to said memory means of said terminating time switching means to transmit said PCM samples from said first and second space switching means to said first and second memory means; and

said first memory means being operated to switch said PCM samples from said first space switching means through said second terminating time switching means to said second telephone subscriber or alternatively said second memory means being operated to switch said PCM samples from said second space switching means through said first terminating time switching means to said second telephone subscriber;

said switching system further including:

said synchronization means operated to simultaneously control said operation of said first and second originating time switching means of said first switching network synchronously with said first and second originating time switching means of said second switching network;

said first and second space switching means of said first switching network simultaneously operated with said first and second space switching means of said second switching network in response to said synchronization means and to said operation of each said first and second originating time switching means; and

said first and second terminating time switching means of said first switching network simultaneously operated with said first and second terminating time switching means of said second switching network in response to said synchronization means and to said operation of each said first and second space switching means.

4,402,078

SIGNALLING SWITCHING SYSTEM IN A TIME SWITCHING NETWORK AND TIME SWITCHING NETWORK INCORPORATING SUCH A SYSTEM

Claude Athenes, and Jacques E. Salle, both of Colombes, France, assignors to Thomson-CSF Telephone, Colombes, France

Filed Mar. 10, 1981, Ser. No. 242,304

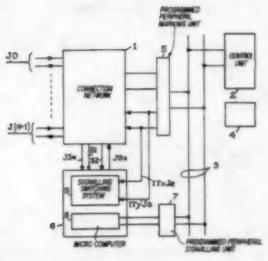
Claims priority, application France, Mar. 11, 1980, 80 05417

Int. Cl.³ H04J *3/02*

U.S. Cl. 370—66 **6 Claims**

1. A signaling switching system in a time switching network, said network being provided with at least one central computer and a peripheral marking unit by means of which correspondence data between incoming and outgoing junction channels is supplied, said marking unit being connected on the one hand by a busbar to said central computer and on the other hand to a connection network to which it supplies the ad-

dresses of two connected channels, firstly that of an incoming channel ITxJe designating the x-th channel of the e-th incoming junction and the second that of an outgoing channel ITyJs designating the y-th channel of the s-th junction, said connection network permitting the exchange of calls between N incoming junctions and N outgoing junctions (J0 to J(N−1)) said switching system forming a multi-frame of p frames, connected to said time switching network, and which supplies and receives in the form of n incoming signaling junctions (JSe) and n outgoing signaling junctions (JSs) of the network, whose frames contain the signaling data of z bits at the rate of r per junction (n being the integer immediately higher or equal to N/r said switching system also provided with a microcomputer fulfilling the function of a signaling receiving and transmitting unit, connected to said central computer, said signal switching system being constituted by a wired logic having on the one hand n inputs connected to the incoming signaling junctions (JSe) and n outputs connected to the outgoing signaling junctions (JSs) and on the other hand two inputs connected to two outputs of the peripheral marking unit supplying to the first input the address of a channel of an incoming junction (ITxJe) and at the second input the address of the channel of the outgoing junction (ITyJs) to which the channel of the incoming junction (ITxJe) is connected, said wired logic being constituted by an input circuit whose n inputs are connected to



the n incoming signaling junctions on which the signaling data are transmitted in series mode with timing H0 and which supplies signaling data to z outputs in parallel with timing n-H0/z, a storage register with z bits, whose z inputs are connected to the z outputs of the input circuit and whose clock input receives the clock signal of frequency n-H0/z, a random-access signaling memory of Nxr words of z bits, whose z inputs are connected to the z outputs of the storage register and which receives the said signaling data, an output circuit whose z inputs are connected to the z outputs of the signaling memory and receive the signaling data in parallel with timing n-H0/z, and whose n outputs supply the n outgoing signaling junctions on which the data are serially transmitted with timing H0, and addressing multiplexer whose outputs are connected to the m addressing inputs of the signaling memory with m equal to $\log_2$ (Nxr), a writing address register whose m ouputs are connected to the inputs of the addressing multiplexer corresponding to writing, a writing addressing circuit whose inputs are connected to the outputs of the input circuit and whose m outputs are connected to the writing address register, a reading address register whose m outputs are connected to the inputs of the addressing multiplexer corresponding to reading and a reading addressing circuit whose inputs are connected to the peripheral marking units and whose m outputs are connected to the inputs of the reading address register.

4,402,079

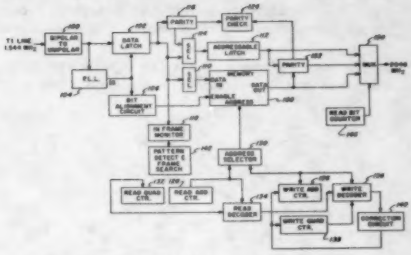
DELAY CORRECTION CIRCUIT

Frank Fellinger, and James M. Ruffing, both of Delaware, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 937,456, Aug. 28, 1978, Pat. No. 4,230,911. This application Oct. 24, 1980, Ser. No. 200,341

Int. Cl.³ G06F *13/00*; G11B *13/00*

U.S. Cl. 370—84 **1 Claim**



1. A delay correction circuit for use with an elastic store in a time division multiplexed system wherein said elastic store comprises memory means for storing incoming data bits, write address generating means for generating write addresses, each of said write addresses identifying a location in said memory means for storing an incoming data bit, and read address generating means for identifying a location in said memory means for reading a stored data bit, said delay correction circuit comprising:

first means responsive to one of said read or write address generating means generating a predetermined address for determining whether the address concurrently generated by the other of said read or write address generating means is within a predetermined range of addresses and for providing a first indication signal if said concurrently generated address leads said predetermined address and a second indication signal if said concurrently generated address lags said predetermined address;

second means responsive to said first indication signal and the generation of a second predetermined address by one of said read or write address generating means for initializing the other of said read or write address generating means to a third predetermined address; and

third means responsive to said second indication signal and the generation of a fourth predetermined address by one of said read or write address generating means for initializing the other of said read or write address generating means to a fifth predetermined address.

4,402,080

SYNCHRONIZING DEVICE FOR A TIME DIVISION MULTIPLEX SYSTEM

Horst Mueller, Hohenschaeftlarn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,059

Claims priority, application Fed. Rep. of Germany, May 19, 1980, 3019078

Int. Cl.³ H04J *3/06*

U.S. Cl. 370—100 **4 Claims**

1. A synchronizing device for a time-division multiplex system which operates with n possible phase positions and a frame codeword having a length of l=k·n bits, comprising:

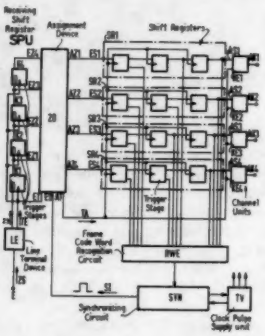
input means including an input for receiving a time-division multiplex signal and first and second outputs, said input means operable to derive input clock signals from the received signal, said first output carrying the received signal and said second output carrying the input clock signals; a series-parallel converter including first and second inputs

respectively connected to said first and second outputs of said input means, a receiving shift register including n stages and a plurality of outputs for providing serially-received bits as parallel bits;

a plurality of shift registers each including a digital signal input, a trigger input, and k stages having a plurality of outputs and operable to store a frame code word at its output;

a frame code word recognition device including a plurality of inputs connected to said outputs of said stages of said plurality of shift registers, an output, and operable to recognize a stored frame codeword to produce a recognition signal at its output;

a synchronizing circuit including an input connected to said output of said frame codeword recognition circuit device



and an output and operable to produce a synchronizing pulse in response to said recognition signal; and

an assignment device for assigning the parallel bits to said plurality of shift registers, said assignment device including a plurality of inputs connected to said outputs of said series-parallel converter, a plurality of outputs connected to said data signal inputs of said shift registers, means assigning said inputs to said outputs, a trigger output connected to said trigger inputs of said plurality of shift registers, a synchronizing input connected to said output of said synchronizing circuit, a clock signal input connected to said second output of said input means, and means operable to derive trigger signals including a n:1 frequency divider including an input connected to said synchronizing input, another input connected to said clock signal input and an output connected to said trigger output.

4,402,081

SEMICONDUCTOR MEMORY TEST PATTERN GENERATING APPARATUS

Yoshichika Ichimiya, Tokorozawa; Tsuneta Sudo, Kodaira, and Masao Shimizu, Gyoda, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Takeda Riken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 8, 1980, Ser. No. 195,079

Claims priority, application Japan, Oct. 19, 1979, 54-135532

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—21 **7 Claims**

1. A test pattern generating apparatus for selectively repeating selected sequences of instructions in a microprogram for testing a memory under test, said apparatus comprising

an instruction memory for storing said instructions of said microprogram at respective addresses, said instructions of said microprogram comprising address and data generating instructions,

a program counter coupled to said instruction memory for providing the sequence of addresses of the instruction memory to be accessed for providing said repeated sequences of said instructions for selectively testing said memory under test,

an address pattern generator coupled to said instruction memory for decoding and executing each said accessed address generating instruction and for generating a corresponding address pattern to be applied to said memory under test,

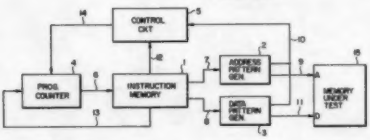
a data pattern generator coupled to said instruction memory for decoding and executing each said accessed data generating instruction and for generating a corresponding data pattern to be applied to the memory under test,

a loop memory for storing at respective addresses a plurality of sets of loop pattern data for defining said repeated sequences of said instructions, said sets of loop pattern data including first sets thereof, each said first set comprising a first start address and a first stop address indicating a corresponding area of the instruction memory to be sequentially accessed between said first start and stop addresses, and first index data indicating the number of times the respective area is to be accessed,

an address counter coupled to said loop memory for sequentially generating the addresses of the loop memory to be accessed for generating said repeated sequences of said instructions,

a first set of registers, each coupled to said loop memory, including a first start address register, a first stop address register and a first index data register for sequentially storing the first start address, the first stop address and the first index data of each respective first set of loop pattern data that is accessed by said address counter, said first start address register being coupled between said loop memory

PRIOR ART



and said program counter, and said first stop address register and said first index data register being coupled to said loop memory,

a first coincidence circuit coupled to said first stop address register and to said program counter for comparing the first stop address loaded in the first stop address register with the current address in the program counter, for detecting coincidences therebetween and for outputting a corresponding first coincidence signal upon each said coincidence, and

a control circuit, coupled to said address counter, to each of said first set of registers and to said program counter, and comprising means for setting each said first start address stored in the first start address register into the program counter responsive to said first coincidence signal for a predetermined number of said first coincidence signals indicated by the respective first index data that was set in the first index data register, for incrementing the content of the address counter, and for replacing the contents of the first start address register, the first stop address register and the first index data register with the respective values of the subsequent first set of said loop pattern data that is accessed by said address counter,

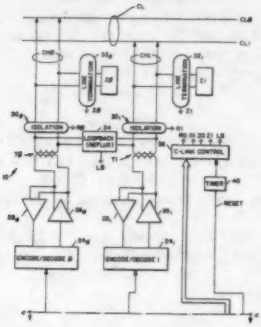
wherein said selected repeated sequences of said instructions of said test pattern are generated by said apparatus for selectively testing said memory under test according to the accessing of said instruction memory the respective number of times indicated by each said first index data between the respective first start and stop addresses of said loop pattern data in the order of said accessing of said loop memory by said address counter.

4,402,082

AUTOMATIC LINE TERMINATION IN DISTRIBUTED INDUSTRIAL PROCESS CONTROL SYSTEM

Michael E. Cope, Richardson, Tex., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 31, 1980, Ser. No. 202,471
Int. Cl.[3] G06F *11/00*; H04B *17/00*
U.S. Cl. 371—22 19 Claims



1. An information transfer system for transferring digital information between stored-program controllers interconnected by a communications link each controller adapted to test the communications integrity of the communications link between it and other of the controllers and connect an impedance to the communications link in the event of an interruption or degradation of the communications integrity of the communications link between the controllers, each system comprising:

a plurality of stored-program controllers interconnected through a communications link, each controller provided with (a) transmitting and receiving means operatively connected to said communications link for transmitting and receiving digital information in messages of predetermined format to and from each other over said communications link, (b) message-checking means operably connected to said transmitting and receiving means for determining if transmitted messages are successfully received by the receiving controller, and (c) selectively operable switch means to selectively connect an impedance to said communications link, each controller including means to cause said transmitting and receiving means to transmit messages to other of said controllers and to provide an actuation signal to said switch means to cause said switch means to connect said impedance to said communications link in response to said message checking means determining that the number of messages successfully received by said other of said controllers is below a predetermined threshold.

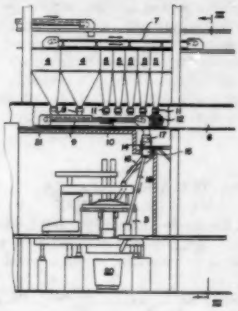
4,402,083

ELECTRIC SMELTING FURNACE AND ASSOCIATED CHARGING EQUIPMENT AND BINS

Edgar Paskarbeit, Oberhausen, and Horst D. Schöler, Duisburg, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,760
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1981, 3107016
Int. Cl.[3] F27D *3/12*
U.S. Cl. 373—79 5 Claims

1. In an electric smelting furnace arrangement of the type having an electric smelting furnace including a furnace vessel, bins, charging equipment means operable for transporting a charge into the bins, conveying means and metering means for removing the charge from the bins, charging tubes for feeding the charge into the furnace vessel, an elongated furnace bay, an elongated ladle bay longitudinally extending adjacent to the furnace bay and crane runways, one of said crane runways being longitudinally extended over a respective one of each of the furnace bay and ladle bay, the improvement wherein the electric smelting furnace is provided in the furnace bay at a side close to the ladle bay adjacent to the furnace bay, the bins comprising first bins for iron stock and second bins for fluxing material and alloying means, and first outlet means connected to said first bins, second outlet means connected to said second bins, conveyors and metering devices located underneath said



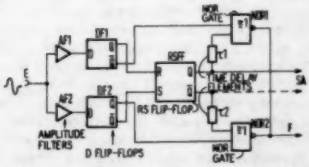
first and second outlet means, wherein said first and second bins, said first and second outlet means, said conveyors and said metering devices are sequentially mounted in the longitudinal direction of said furnace and ladle bays in a vertical zone between said crane runways of the furnace bay and the adjacent ladle bay, and a reversible conveyor extending transversely to the longitudinal direction of said furnace and ladle bays at lower level beneath said bins, said outlet means, said first-mentioned conveyors and said metering devices, discharge means at both ends of said reversible conveyor, and charging tubes for receiving discharge from said discharge means.

4,402,084

REGENERATOR HAVING A CODE RULE VIOLATION CHECKING DEVICE

Hans G. Jungmeister, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,987
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027733; Feb. 12, 1981, 3105120
Int. Cl.[3] H04L *25/66*
U.S. Cl. 375—4 8 Claims



1. A regenerator for PCM signals represented in the AMI code, comprising:

input means for receiving positive and negative input pulses;

first and second D flip-flops each including a D input, a Q output and a Q output;

means connecting said input means to said D inputs of said first and second D flip-flops and operable to provide the

positive input pulses to said first D flip-flop and negative input pulses to said second D flip-flops to cause said D flip-flops to produce respective pulses;

an RS flip-flop including a Q output, a Q output and a set input and a reset input respectively connected to selected outputs of said D flip-flops and operable in response to pulses produced by said D flip-flops to regenerate the input signals supplied thereto via said first and second D flip-flops as respective unipolar pulse trains at said Q and Q outputs of said RS flip-flop, each unipolar pulse train containing the entire information received from the input pulses, the pulses of said pulse trains having a predetermined bit duration; and first and second gate circuits each including two inputs and an output, said outputs of said first and second gate circuits connected together as a wired OR gate for providing fault signals, a first input of each gate circuit connected to a respective output of said RS flip-flop and a second input of each gate circuit connected to a selected output of a respective D flip-flop.

4,402,085

TOMOGRAPHIC X-RAY APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

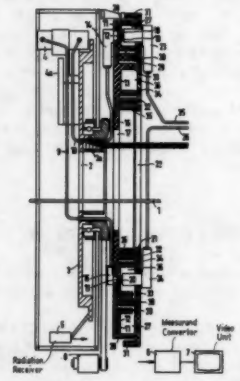
Walter Distler, Erlangen-Dechsendorf, and Karl-Georg Heinzelmann, Neunkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,224

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010819

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—15 **3 Claims**



1. A tomographic x-ray apparatus for the production of transverse layer images of a radiography subject, comprising a patient support, an x-ray measuring arrangement including an x-ray source, which generates an x-ray beam penetrating the radiography subject, and a radiation receiver which determines the radiation intensity behind the subject, a drive device for the measuring arrangement, a rotating frame for effecting rotational scanning movement of the measuring arrangement, and a measured value converter for the transformation of the signals delivered by the radiation receiver into a layer image, a stationary apparatus part and the rotating frame having a plurality of slip ring arrangements therebetween for the supply of current to the x-ray tube, each slip ring arrangement comprising two coaxial ring members (**16, 21**), of which one (**16**) is connected with the rotationg frame (**3**), and the other is stationary, said coaxial ring members having sliding contacts (**18, 19, 20**) for the transmission of the x-ray tube current, said stationary part and rotating frame having interpenetrating axially projecting ribs (**28** to **35**), and having central openings (**17, 22**) of size to receive the patient support (**1**) therethrough, said plurality of slip ring arrangements having first and second slip rings (**11, 13**) in engagement with respective ones of the sliding contacts (**18, 20**) for conducting x-ray tube current during rotational scanning movement of the measuring arrangment, said interpenetrating axially projecting ribs defining first and second annular chambers (**27, 36**) containing the first and second slip rings (**11, 13**) respectively, and including oppositely axially projecting laterally overlapping annular ribs (**29, 30, 33**) of insulating material between said first and second annular chambers (**27, 36**) and defining a meandering air path between said first and second slip rings (**11, 13**), so as to electrically isolate said first and second slip rings with air without immersion thereof in insulating oil.

4,402,086

SAFETY DEVICE FOR EXTRA-HIGH VOLTAGE GENERATOR, PARTICULARLY AN X-RAY GENERATOR

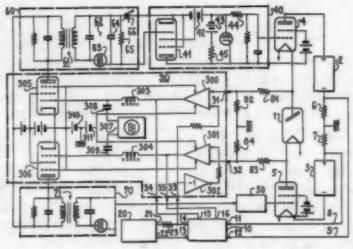
Raoul Setbon, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 25, 1981, Ser. No. 237,897

Claims priority, application France, Feb. 29, 1980, 80 04603

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—112 **8 Claims**



1. In an extra-high voltage generator connected to an X-ray tube for polarizing the electrodes of said X-ray tube into direct current voltages incorporating at least one vacuum tube with control grids inserted by its anode-cathode path between at least one of the positive and/or negative poles of at least one source of said voltage and one of the electrodes of the X-ray tube, the control grid of each vacuum tube being energized by means of a voltage control loop incorporating a square-wave nominal value signal generator supplying a first nominal value signal whose duration corresponds to the exposure time and whose amplitude is a predetermined and regulatable fraction of the desired polarization voltage of the X-ray tube, an analog comparator circuit for comparing said first nominal value signal with a constant fraction of the voltage applied to one of the electrodes of the X-ray tube relative to earth and supplying an error voltage, an amplitude modulator amplifying the wave supplied by an oscillator as a function of said error signal, an amplitude demodulator coupled to said amplitude modulator in an insulating manner by means of a transformer and for the duration of said first nominal value signal supplying a demodulated direct voltage to a control circuit polarizing the grid of the vacuum tube with respect to its cathode; a safety device comprising at least one measuring resistor inserted between the other positive and/or negative terminal of the at least one source and earth and supplying between its terminals a voltage drop proportional to the current in the X-ray tube; a high-speed electronic switching having a threshold receiving said voltage drop and which controls its closure when it exceeds a predetermined threshold value corresponding to exceeding the nominal current in the tube by a predetermined quantity; means for controlling the temporary inhibition of the transmission of the modulated wave to the demodulator in such a way

as to bring about the cut-off of the vacuum tubes by the initial polarization of its grid in the absence of demodulated voltage, the disappearance of current in the series-connected vacuum tubes and the X-ray tube leading to the automatic re-opening of the switch and the rapid re-application of the polarization voltage of the X-ray tube, when the variation between the successive exceedings of said threshold is greater than a predetermined time interval.

4,402,087

BINARY CODING CIRCUIT

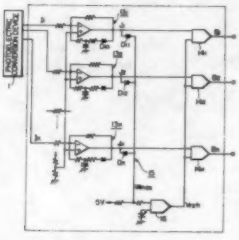
Fukuma Sakamoto; Isao Isshiki; Masatoshi Tanaka, and Koji Satoh, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 18, 1980, Ser. No. 170,238

Claims priority, application Japan, Jul. 20, 1979, 54-92311; Jul. 20, 1979, 54-99314[U]; Sep. 3, 1979, 54-112602

Int. Cl.³ G06K *9/36*

U.S. Cl. 382—53 **15 Claims**



1. A binary coding circuit in which analog electrical signals outputted in a parallel mode by a photoelectric conversion device having a plurality of photoelectric conversion elements arranged two-dimensionally are converted into binary signals representative of a character region and a background region comprising: a plurality of comparators; a plurality of level adjusting circuit means having inputs coupled to outputs of respective predetermined ones of said conversion elements for producing analog signals having a constant base level independent of changes in base levels of said outputs of said conversion elements, said constant base level being the same among all said level adjusting circuit means, said analog electric signals being applied to first input terminals of respective ones of said comparators; and a reference voltage generating circuit for setting a binary coding threshold voltage applied to second input terminals of said comparators having a base level determined in accordance with an extremum among base levels of said analog signals.

4,402,088

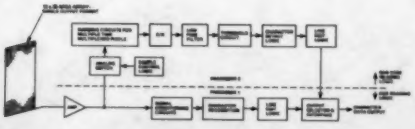
OCR AND BAR CODE READING USING AREA ARRAY

Lynn D. McWaters, Garland, and Medford D. Sanner, Irving, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Apr. 9, 1981, Ser. No. 252,556

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—68 **7 Claims**



1. A hand held optical reader for scanning and reading alphanumeric and bar code data comprising; an optical area array scanner having a plurality of columns of photo sensors for scanning on face of a document and for producing an output signal representative of the data scanned, and two processor channels, each processor channel analyzing at least a part of the output signal produced by said scanner, and an output selecting circuit outputing the analyzed data from one or the other of said processor channels.

4,402,089

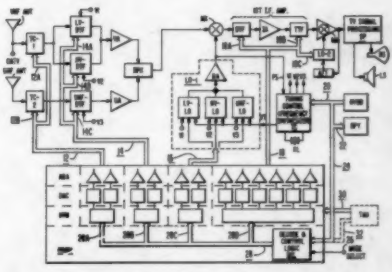
TELEVISION TUNING SYSTEM WITH ELECTRONIC FREQUENCY ADJUSTMENT APPARATUS

Stanley P. Knight, Cranbury, and John G. N. Henderson, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 16, 1981, Ser. No. 302,853

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—186 **25 Claims**



1. A tuning system for a receiver for selecting one radio frequency (RF) signal of a plurality of receivable RF signals comprising:

RF means having first elements for providing a frequency selective characteristic with respect to at least a first frequency and having a second element for trimming said frequency selective characteristic with respect to substantially said first frequency in response to a trimming signal;

oscillator means for developing an oscillator signal, the frequency of which is controlled by a first control signal for selecting said one RF signal;

mixer means for heterodyning RF signals from said RF means and said oscillator signal to develop an intermediate frequency (IF) signal at a predetermined frequency;

first control means for developing said first control signal for selecting said one RF signal so that said one RF signal is shifted in frequency to said predetermined IF frequency by said mixer means; and

second control means for developing said trimming signal having different predetermined magnitudes corresponding to groups of adjacent ones of said RF signals, and for applying said trimming signal to said second element to effect said trimming of said frequency selective characteristic.

4,402,090

COMMUNICATION SYSTEM IN WHICH DATA ARE TRANSFERRED BETWEEN TERMINAL STATIONS AND SATELLITE STATIONS BY INFRARED SIGNALS

Fritz R. Gfeller, Adliswil, and Hans R. Mueller, Langnau, both of Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

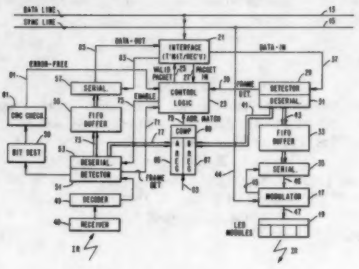
Filed Nov. 13, 1981, Ser. No. 321,140

Claims priority, application European Pat. Off., Dec. 23, 1980, 80 108 155.5

Int. Cl.³ H04B 9/00

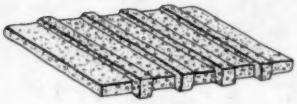
U.S. Cl. 455—601 6 Claims

1. A communication system in which data are transferred between terminal stations and satellite stations by infrared signals, characterized in that for covering an extended area, a plurality of satellite stations (S1–S8) each with infrared transmitting means (17, 19) operating at a common carrier frequency are provided, the radiation fields of said transmitting means at least partially overlapping, and that common electrical link means (13, 15) are provided for transferring to all said satellite stations data signals (13) which are to be distributed to all said terminal stations simultaneously, and for further transferring a common timing signal (15) to all said satellite stations for synchronizing the carrier signals in said transmitting means, and that each terminal station within said extended area is provided with means for selectively accepting only one set of the simultaneously distributed data signals in any time period

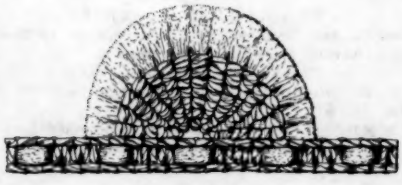


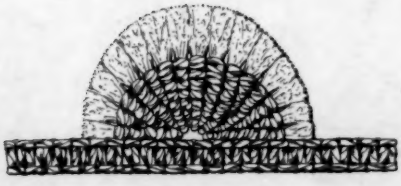
even if said terminal receives the infrared signals radiated by two or more satellite stations during said time period.

270,299
FORMED MEAT PRODUCT
Rene Arend, Chicago, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.
Filed Jan. 26, 1981, Ser. No. 228,193
Term of patent 14 years
Int. Cl. D01—*04*
U.S. Cl. D1—26

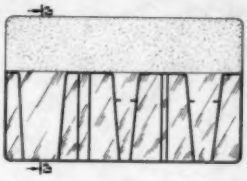


270,300
ORNAMENTAL HAT BAND
Robert L. Jarvis, Trenton, Mo., assignor to Jarvis Properties, Trenton, Mo.
Filed May 14, 1981, Ser. No. 263,756
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—261

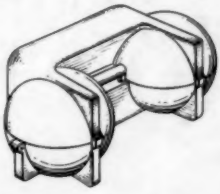




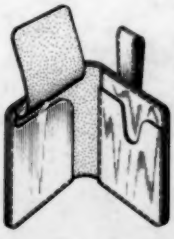
270,301
HOLDER FOR SURGICAL INSTRUMENTS
Marguerite L. Dafoe, Spotswood, and Stanley W. Walasek, Bridgewater, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.
Filed Jun. 24, 1981, Ser. No. 276,867
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1



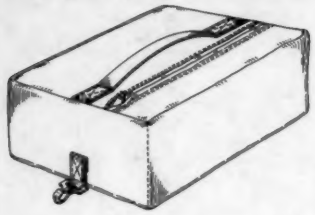
270,302
BOWLING BALL CARRYING CASE
Edward M. Starzec, Canoga Park, Calif., assignor to Chas. "Robby" Robinson Enterprises, Inc., Glendale, Calif.
Filed Dec. 14, 1981, Ser. No. 330,188
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—36



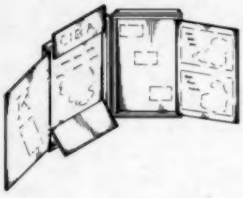
270,303
COMBINED WALLET AND CLIP
James I. Zautner, Kewaskum, Wis., assignor to Enger Kress Company, West Bend, Wis.
Filed Aug. 7, 1981, Ser. No. 290,911
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—56



270,304
INSULATED CONTAINER
Peter W. McGennis, 41 Saybrook Pl., Buffalo, N.Y. 14209
Division of Ser. No. 879,695, Feb. 21, 1978, Pat. No. Des. 256,853. This application Jun. 9, 1980, Ser. No. 157,788
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



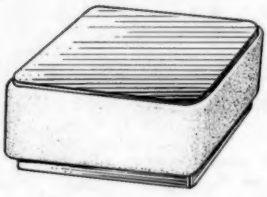
270,305
MULTI PANEL DISPLAY CASE
Ernest E. Errigo, 8937 Wyndam Rd., Pennsauken, N.J. 08110
Filed Feb. 23, 1981, Ser. No. 237,447
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74



270,306
LUGGAGE
Ted Stark, Montclair, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,291
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—77

270,307
DENTAL PROPHYLACTIC DEVICE
William P. Hollingshead, 2210 Park Ave., Easton, Pa. 18042
Filed Sep. 21, 1981, Ser. No. 303,784
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—24

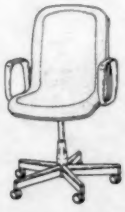
270,308
TABLE
Robert J. Aronowitz, New York, and Bernard D. Katzanek, Brooklyn, both of N.Y., assignors to Robert Bernard Associates, Inc., Brooklyn, N.Y.
Filed Sep. 12, 1979, Ser. No. 74,607
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27



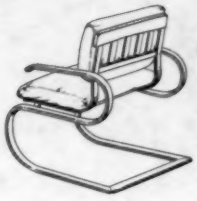
270,309
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,526
Claims priority, application Switzerland, Sep. 10, 1979, DMA/000007
The portion of the term of this patent subsequent to Aug. 30, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

270,310
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,453
Claims priority, application Switzerland, Sep. 10, 1979, DMA/000007
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

270,311
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,459
Claims priority, application Switzerland, Sep. 10, 1979, DMA/000007
The portion of the term of this patent subsequent to Aug. 30, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

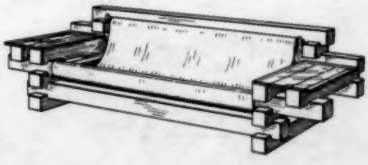


270,312
DINING CHAIR
Larry G. Hickey, Costa Mesa, Calif., assignor to Tropitone Furniture Co., Inc., Sarasota, Fla.
Filed Dec. 23, 1980, Ser. No. 223,489
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

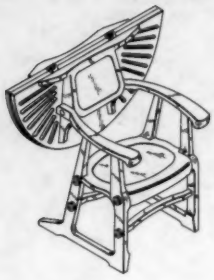


270,313
CHAIR
Edsel E. Murry, Rte. 1, Samsonite Blvd., Murfreesboro, Tenn. 37130
Filed Jun. 11, 1981, Ser. No. 272,748
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

270,314
SEAT
Sandy Helland, 650 Parliament St., Apt. 2202, Toronto, Ontario, Canada (M4X 1R3)
Filed Jun. 22, 1981, Ser. No. 276,068
Claims priority, application Canada, May 5, 1981, 05-05-81-5
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60



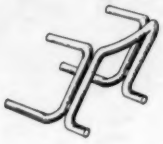
270,315
CONVERTIBLE CHAIR
Gordon L. Kyle, 211 Great Neck Rd., Waterford, Conn. 06385
Filed Jun. 4, 1981, Ser. No. 270,634
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—64



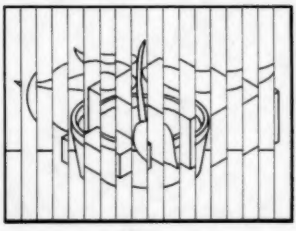
270,316
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,457
Claims priority, application Switzerland, Sep. 10, 1979, DMA/000007
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

270,317
ENTERTAINMENT TABLE OR SIMILAR ARTICLE
Ward Fleming, 1449 Stevenson St., San Francisco, Calif. 94103
Filed Mar. 21, 1980, Ser. No. 91,125
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

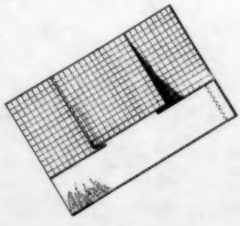
270,318
CHAIR BASE
Edsel E. Murry, Rte. 1, Samsonite Blvd., Murfreesboro, Tenn. 37130
Filed Jun. 11, 1981, Ser. No. 272,745
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



270,319
PLURAL DISPLAY WITH A COMPOSITE PICTURE
Samuel Greenberg, 4900 Bathurst St., Apt. 306, Willowdale, Ontario, Canada
Filed Aug. 15, 1978, Ser. No. 934,130
Claims priority, application Canada, Jun. 5, 1978, 05-06-78-4
Term of patent 14 years
Int. Cl. D7—*99*; D20—*03*
U.S. Cl. D6—234

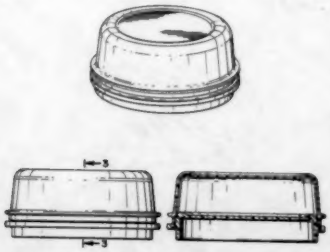


270,320
COMBINED PILLOWCASE AND HEAD COVERING
Jean E. Smith, 3305 Longbow Dr., Pittsburgh, Pa. 15235
Filed Dec. 8, 1980, Ser. No. 214,436
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—264

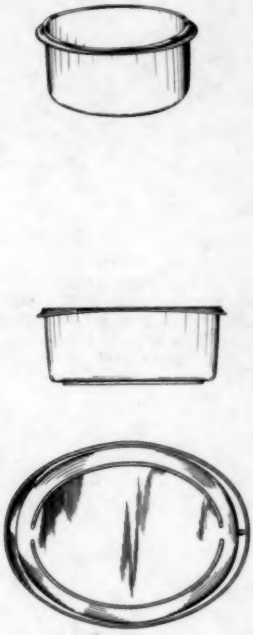


270,321
COVERED CONTAINER
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Oct. 26, 1981, Ser. No. 314,694
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17

270,322
CHEESE DISH OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, and Pieter K. Jan de Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 27, 1981, Ser. No. 248,092
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—84

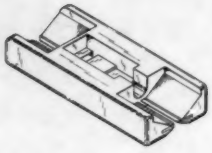


270,323
CASSEROLE
Robert M. Powers, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Apr. 9, 1981, Ser. No. 252,412
Term of patent 14 years
Int. Cl. D07—*01, 02*
U.S. Cl. D7—21

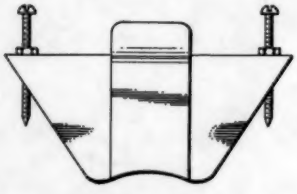


270,324
PLATE WITH GLASS HOLDER
Michael J. French, 12 Cedar House, Ancastle Green, Henley on Thames, Oxfordshire, England
Filed Jul. 28, 1981, Ser. No. 287,585
Claims priority, application United Kingdom, Feb. 2, 1981, 998693
Term of patent 14 years
Int. Cl. D07—*01, 99*
U.S. Cl. D7—70

270,325
ELECTRICAL CONNECTOR APPLICATION TOOL
James J. Johnston, Old Saybrook, Conn., assignor to Akzona Incorporated, Asheville, N.C.
Filed Sep. 18, 1980, Ser. No. 188,604
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

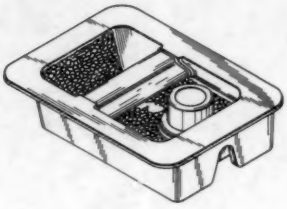


270,326
LAP SIDING TOOL
Jack R. Sickler, P.O. Box 20803, Billings, Mont. 59104
Filed Jul. 28, 1980, Ser. No. 173,083
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16

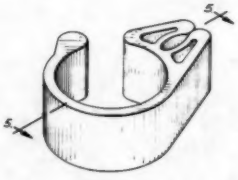


270,327
WIRE HANDLING TOOL
Mark A. Steck, Miamisburg, Ohio, assignor to Steck Manufacturing Co., Inc., Dayton, Ohio
Filed May 4, 1981, Ser. No. 260,031
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16

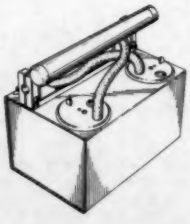
270,328
LATCH HOUSING WITH PUSH BUTTON
Edwin W. Davis, and Lee S. Weinerman, both of Medina, Ohio, assignors to The Eastern Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 131,779, Mar. 19, 1980, Pat. No. D. 265,965. This application Mar. 18, 1981, Ser. No. 245,151
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—302



270,329
CLIP FOR MICROPHONE CABLE
Bruce N. Hardy, Elkhart, Ind., assignor to Silver Street, Inc., Elkhart, Ind.
Filed Feb. 23, 1981, Ser. No. 236,909
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



270,330
DUAL LIQUID STORAGE CONTAINER
Ralph A. Bolen, London, Ohio, assignor to John Sawyer, Cincinnati, Ohio
Filed Jun. 2, 1981, Ser. No. 269,683
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—337



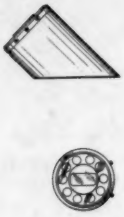
270,331
JAR
Frederick R. Benson, Flat 2, 15 Heath Dr., Hampstead, London N.W.3, England
Filed Oct. 9, 1979, Ser. No. 82,934
Claims priority, application United Kingdom, Jul. 14, 1979, 990734
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

270,332
CAN OR THE LIKE
Thomas N. Gaunt, Leeds, England, assignor to Plastona (John Waddington) Limited, Leeds, England
Filed Dec. 3, 1980, Ser. No. 212,487
Claims priority, application United Kingdom, Aug. 28, 1980, 996333
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

270,333
COMBINED BOTTLE AND CAP
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 21, 1980, Ser. No. 209,259
The portion of the term of this patent subsequent to May 10, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—383

270,334
COMBINED BOTTLE AND CAP
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 21, 1980, Ser. No. 209,260
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—383

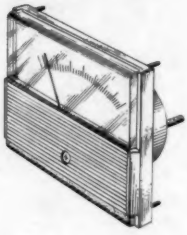
270,335
COMBINED DIGITAL CLOCK AND THERMOMEETER
Philip Y. Lam, 161 Kweilin St., Kowloon, Hong Kong
Filed Jul. 20, 1981, Ser. No. 284,663
Claims priority, application United Kingdom, Feb. 2, 1981, 998699
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—4



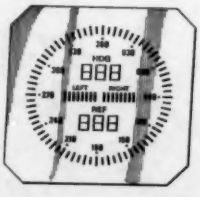
270,336
TIMER
Pizzitola, Jr., Frank J., 10311 Sageglow, Houston, Tex. 77089
Filed Jun. 15, 1981, Ser. No. 273,722
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

270,337
MULTIMETER
Masahiro Tanabe, Tokyo, Japan, assignor to Akigawa Electronic Corporation, Tokyo, Japan
Filed Jun. 30, 1980, Ser. No. 164,145
Claims priority, application Japan, Feb. 8, 1980, 55-4228
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

270,338
PANEL METER
Richard A. Heck, West Bloomfield, and Louis L. Mastro, Milford, both of Mich., assignors to Square D Company, Palatine, Ill.
Filed Feb. 13, 1981, Ser. No. 234,215
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—102



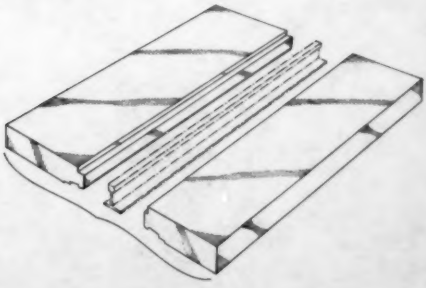
270,339
DISPLAY PLATE FOR AN ELECTRONIC NAVIGATION AID
Gerard F. Boleis, 251 E. 51st St., New York, N.Y. 10022
Filed Sep. 5, 1980, Ser. No. 184,232
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



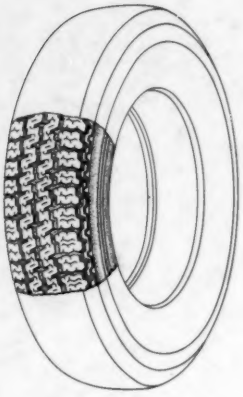
270,340
ORNAMENT
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Dec. 1, 1981, Ser. No. 326,376
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—125

270,341
ORNAMENT
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Nov. 24, 1981, Ser. No. 324,565
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

270,342
PAIR OF RAILROAD CROSSING STRUCTURAL COMPONENTS
Lorn L. Trickel, 8806 NE. Thompson, Portland, Oreg. 97220, and William H. Stultz, 9424 N. Burr St., Portland, Oreg. 97203
Filed Mar. 19, 1981, Ser. No. 245,258
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—49

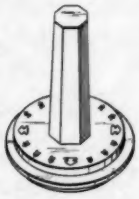


270,343
TIRE
Renato Caretta, Gallarate, Italy, assignor to Industrie Pirelli, Milan, Italy
Filed Jun. 3, 1981, Ser. No. 270,011
Claims priority, application Italy, Dec. 5, 1980, 23551 B/80
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

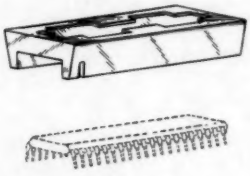


270,344
PLASTIC WHEEL
Joel C. Cunard, and William H. Ziegler, Jr., both of Bedford, Pa., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.
Filed Jan. 22, 1981, Ser. No. 227,162
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

270,345
VIDEO GAME CONTROL GRIP
Richard A. Scherer, Huntington Beach, Calif., assignor to Injoy-A-Stick, Fountain Valley, Calif.
Filed Aug. 2, 1982, Ser. No. 404,389
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

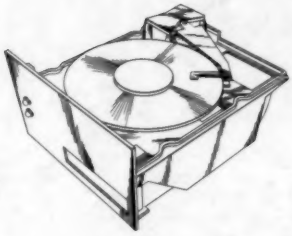


270,346
INTEGRATED-CIRCUIT CARRIER
Bruce M. Smith, 11 Meadowbrook Rd., Dover, Mass. 02030
Filed Nov. 7, 1980, Ser. No. 205,019
Term of patent 14 years
Int. Cl. D13—*03*; D9—*99*
U.S. Cl. D13—99



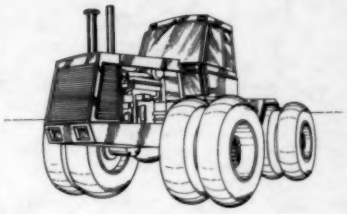
270,347
WORD PROCESSOR USABLE ALSO AS OFFICE COMPUTER AND TERMINAL MACHINE FOR COMPUTER
Takashi Yomo, Yokohama, and Akira Miyakawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1981, Ser. No. 242,346
Claims priority, application Japan, Sep. 12, 1980, 55-37684
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—103

270,348
INTEGRATED DISC AND TAPE RECORDER DRIVE UNIT
Samuel N. Irwin; Otto R. Butsch; Francis Lum, all of Ann Arbor, and Juan F. Velazquez, Saline, all of Mich., assignors to Irwin International, Inc., Ann Arbor, Mich.
Filed Sep. 8, 1980, Ser. No. 185,252
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109

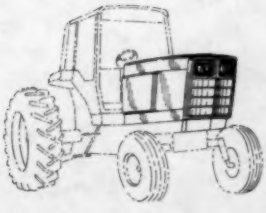


270,349
COMPUTER
Dennis C. Stead, S. Orleans, Mass., assignor to Data General Corporation, Southboro, Mass.
Filed Jul. 3, 1980, Ser. No. 165,509
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

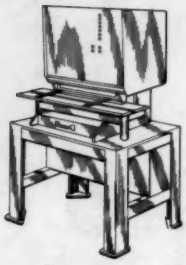
270,350
AGRICULTURAL VEHICLE
Lawrence F. Clancy, Aurora; John M. Parks, Peoria, and Eugene M. Popiawski, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 14, 1980, Ser. No. 196,970
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23



270,351
HOOD PORTION OF A TRACTOR VEHICLE
Gregg C. Montgomery, Hinsdale; George E. Bowman, Country Club Hills, and Robert A. Skyer, Palatine, all of Ill., assignors to International Harvester Co., Chicago, Ill.
Filed Jul. 29, 1981, Ser. No. 287,837
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—31



270,352
PRINTED CIRCUIT PROFILER
Gilbert T. Lopez, 10790 N. 49th, Longmont, Colo. 80501
Filed Apr. 23, 1981, Ser. No. 256,704
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—129

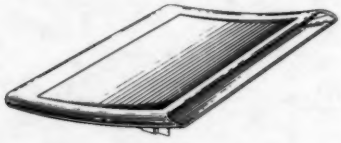


270,353
THERMOPLASTIC MATERIAL MELTING APPARATUS
Richard R. Lewellen, Wooster, Ohio, assignor to Nordson Corporation, Amherst, Ohio
Filed Sep. 14, 1981, Ser. No. 301,519
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—144

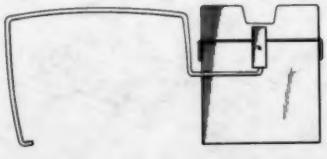
270,354
PAIR OF SUNGLASSES
Melvin H. Boldt, Glenview; David P. Chuboff, North Barrington, and Tom Takeuchi, Mount Prospect, all of Ill., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sep. 4, 1980, Ser. No. 184,434
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—102

270,355
PROTECTIVE POCKET FOR THE DIALING KNOBS OF THE PRINTHEAD OF A LABELLING APPARATUS
Werner Becker, Hirschhorn, and Wolfgang Reinke, Rothenberg, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Dec. 17, 1980, Ser. No. 217,550
Claims priority, application Switzerland, Jul. 4, 1980, 111293/80
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—19

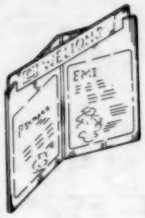
270,356
SUPPORT FOR A SHEET PAD OR THE LIKE
Carla Beltrami, 11823 de Poutrincourt, Montreal, Canada
Filed Jun. 17, 1981, Ser. No. 274,418
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—86



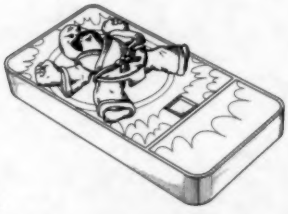
270,357
DOCUMENT HOLDER FOR A DISPLAY TERMINAL
Richard R. Dillon, Wellesley, and Helmut H. Henneberg, Canton, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Jul. 2, 1981, Ser. No. 279,876
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



270,358
TWO PANEL DISPLAY
Ernest E. Errigo, 8937 Wyndam Rd., Pennsauken, N.J. 08110
Filed Feb. 23, 1981, Ser. No. 237,443
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



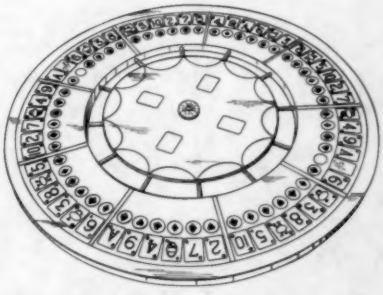
270,359
ELECTRONIC GAME HOUSING
Joseph M. Burck, Glenview, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Aug. 14, 1981, Ser. No. 270,916
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



270,360
ELECTRONIC GAME HOUSING
James C. Wickstead, Pitney Rd. and W. Main St., Mendham, N.J. 07945
Filed Oct. 2, 1981, Ser. No. 307,994
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

270,361
GAME BOARD
Louis W. de Gregorio; James Rozzi, both of Las Vegas, Nev.; Jerrold L. Polinsky, Somers Point, and Richard L. Segal, Ventnor, both of N.J., assignors to Chance Games, Inc., Linwood, N.J.
Filed Dec. 29, 1980, Ser. No. 221,047
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—26

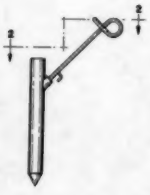
270,362
GAME WHEEL
Louis W. de Gregorio; James Rozzi, both of Las Vegas, Nev., and Gary L. Polinsky, Absecon, N.J., assignors to Chance Games, Inc., Linwood, N.J.
Filed Dec. 29, 1980, Ser. No. 221,046
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—40



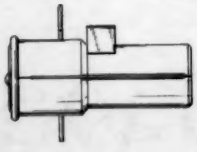
270,363
SET OF CHESSPIECES
Webb Nichols, 5 North Sq., Boston, Mass. 02113
Filed Oct. 18, 1978, Ser. No. 952,340
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—52

270,364
INFLATABLE BUOYANT TOY
Brenda E. Sanderson, Pennant Hills, Australia, assignor to Charles Lonstein, Jeppestown, South Africa
Filed Apr. 15, 1981, Ser. No. 254,402
Claims priority, application Australia, Dec. 22, 1980, 82,910
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—71

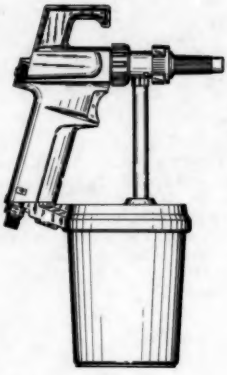
270,365
ANCHOR POST WITH INTEGRAL FASTENER FOR FLEXIBLE LINE
James J. Hawk, 12906 Peoria, Houston, Tex. 77015
Filed Oct. 27, 1980, Ser. No. 200,642
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—255

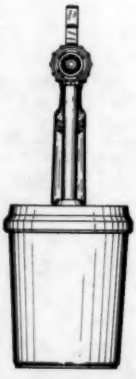


270,366
SIGNAL DEVICE FOR FISHING RODS
Terrance R. Barnes, McLoud, Okla., assignor to Barnes Industries, Inc., Oklahoma City, Okla.
Filed May 11, 1981, Ser. No. 262,342
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

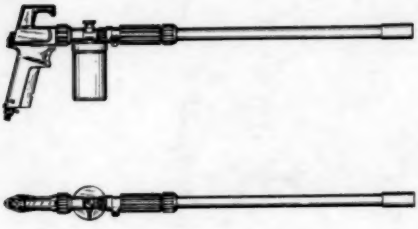


270,367
SPRAY GUN
Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Jun. 1, 1981, Ser. No. 269,348
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



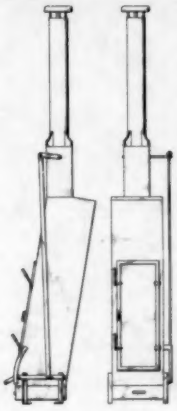


270,368
SPRAY GUN
Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Jun. 1, 1981, Ser. No. 269,349
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

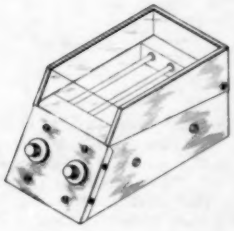


270,369
UNIVERSAL PNEUMATIC SWIVEL
Elwin H. Fleckenstein, Alden, N.Y., assignor to Dynabrade, Inc., Tonawanda, N.Y.
Filed Jan. 30, 1981, Ser. No. 229,778
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

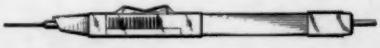
270,370
FIREBOX
Leslie Blevins, Jr., R.R. #1, Lawrence, Kans. 66044
Filed Feb. 25, 1981, Ser. No. 238,121
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



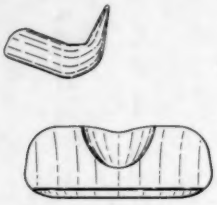
270,371
ROTARY MIXER FOR PHARMACEUTICAL VIALS
Wilton W. Lee, 3578 Twin Oaks Dr., and Larry E. Brown, 4422 Summerfield Dr., both of Napa, Calif. 94558
Filed Oct. 10, 1980, Ser. No. 196,063
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—22



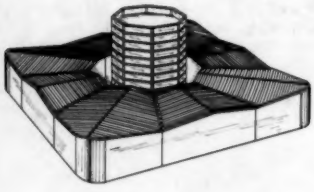
270,372
ELECTRO-SURGICAL SCALPEL
Ronald D. Russo, Barrington, R.I.; Sam W. Darsie, Boulder, Colo., and Len Curado, East Greenwich, R.I., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed Nov. 21, 1979, Ser. No. 96,353
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28



270,373
FACIAL IMPLANT
Richard E. Straith, 625 Hillcrest Dr., Bloomfield Hills, Mich. 48013
Filed Apr. 27, 1981, Ser. No. 257,594
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

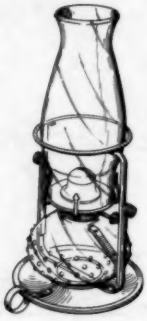


270,374
COMBINED MOTION PICTURE AND TELEVISION STUDIO BUILDING STRUCTURE
Davis W. Pennington, 9336 W. Washington Blvd., Culver City, Calif. 90230, and Jon L. Kindberg, 22700 Chase Pl., Canoga Park, Calif. 91304
Filed Jun. 22, 1981, Ser. No. 275,803
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—5

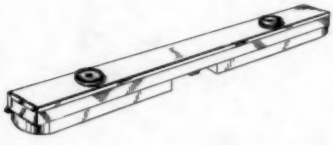


270,375
EXTRUDED SECTION FOR FRONT FACE OF FACADE OF BUILDINGS
Jean-Francois Cavalie, Gaillac, France, assignor to Technal International S.A., Toulouse, France
Filed Dec. 26, 1979, Ser. No. 107,319
Claims priority, application France, Jun. 25, 1979, 79 1531
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

270,376
OIL LAMP
Donald W. Tendick, Sr., Wauwatosa, Wis., assignor to Lamplight Farms, Inc., Brookfield, Wis.
Filed Sep. 24, 1981, Ser. No. 305,104
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—63



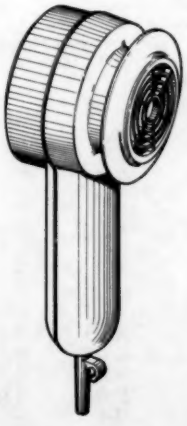
270,377
LIGHTING FIXTURE
Paul R. Maguire, Los Angeles, Calif., assignor to Pleion Corporation, Santa Ana, Calif.
Filed Mar. 13, 1981, Ser. No. 243,655
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—75



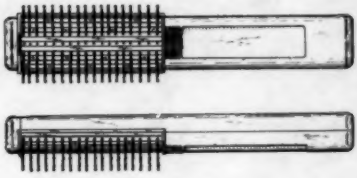
270,378
CIGARETTE HOLDER
Thomas C. Tourand, 2662 Butner Rd., Atlanta, Ga. 30331
Filed Apr. 20, 1979, Ser. No. 31,774
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—02

270,379
PHARMACEUTICAL TABLET
Carl J. Short, Manhatten Beach, and Gale K. Bensussen, Los Angeles, both of Calif., assignors to P. Leiner Nutritional Products, Inc., Torrance, Calif.
Filed Aug. 26, 1981, Ser. No. 296,454
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—3

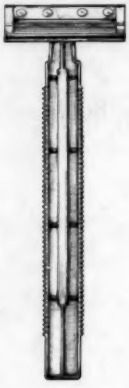
270,380
HAIR DRYER
John R. Armstrong, Broadstone, England, assignor to F C F Limited, Poole, England
Filed Mar. 16, 1981, Ser. No. 243,734
Claims priority, application United Kingdom, Jan. 3, 1981, 998317
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



270,381
HEATED STYLING BRUSH
Ronald L. Muller, Old Saybrook, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 1, 1981, Ser. No. 250,971
Term of patent 14 years
Int. Cl. D28—*03*; D04—*02*
U.S. Cl. D28—13



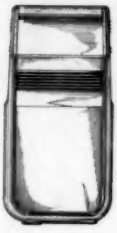
270,382
RAZOR
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 5, 1981, Ser. No. 270,936
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



270,383
SHAVING CARTRIDGE
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 25, 1982, Ser. No. 352,148
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—47

270,384
RAZOR HANDLE
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 10, 1982, Ser. No. 347,545
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

270,385
ELECTRIC SHAVER
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Jul. 6, 1981, Ser. No. 282,104
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1981, 73 MR 8946
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

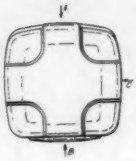


270,386
POWDER COMPACT
Jackey K. Lee, New Territories, Hong Kong, assignor to Lomak Industrial Company Limited, New Territories, Hong Kong
Filed Jan. 11, 1982, Ser. No. 338,490
Claims priority, application United Kingdom, Jul. 20, 1981, 81/1001561
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—80

270,387
CARRYING CASE FOR MAKEUP OR THE LIKE
Paul N. Rutherford, Romford, England, assignor to Noxell Corporation (UK) Limited, Romford, England
Filed Sep. 11, 1981, Ser. No. 301,174
Claims priority, application United Kingdom, Mar. 13, 1981, 999426
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

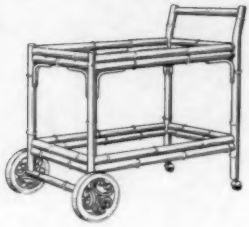
270,388
VANITY MIRROR
Jackey K. Lee, Kwai Chung, Hong Kong, assignor to Lomak Industrial Company Limited, Kwai Chung, Hong Kong
Filed Jan. 19, 1982, Ser. No. 340,653
Claims priority, application United Kingdom, Aug. 19, 1981, 1002064
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

270,389
VANITY MIRROR
Jackey K. Lee, Kwai Chung, Hong Kong, assignor to Lomak Industrial Company Limited, Kwai Chung, Hong Kong
Filed Feb. 8, 1982, Ser. No. 346,736
Claims priority, application United Kingdom, Aug. 19, 1981, 1002065
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

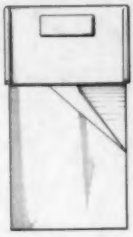


270,390
VACUUM CLEANER
Isao Ayukawa; Sachio Yamamoto, and Akira Tsukada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 27, 1981, Ser. No. 319,027
Claims priority, application Japan, Jan. 29, 1981, 56-3292
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21

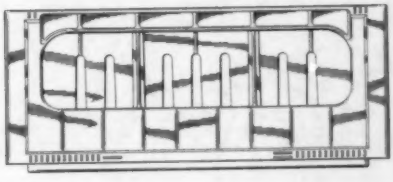
270,391
SERVING CART
Gregory D. Bergquist, Mountain Brook, and John A. Jones, Trussville, both of Ala., assignors to Meadowcraft Inc., Birmingham, Ala.
Filed Sep. 22, 1980, Ser. No. 189,444
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—21



270,392
QUILL CAN
Olin H. Baker, and Robert P. Reilly, both of Madison, Ind., assignors to Meese, Inc., Madison, Ind.
Filed Mar. 22, 1979, Ser. No. 22,707
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D34—43



270,393
BEVERAGE BOTTLE CASE
Lamar H. Russell, Atlanta, Ga., assignor to GCC Beverages, Inc., Chestnut Hill, Mass.
Filed Oct. 16, 1980, Ser. No. 197,489
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—45



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TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.Kettenbach Fabrik Chemischer Erzeugnisse, Dental-Spezialitaten GmbH & Co. KG.: *See*—
Jahn, Ulrich W. K.; and Holzapfel, Bernd H., 4,401,498, Cl. 156-307.100.

AB Jonkoping-Vulcan: *See*—
Gerhardson, Gunnar D., 4,401,615, Cl. 264-119.000.

AB Volvo: *See*—
Ronbeck, Arne I., 4,400,984, Cl. 74-103.000.

Abe, Katsuo; Kobayashi, Shigeru; Kamei, Tsuneaki; Tateishi, Hideki; and Aiuchi, Susumu, to Hitachi, Ltd. Sputtering cathode structure for sputtering appparatuses, method of controlling magnetic flux generated by said sputtering cathode structure, and method of forming films by use of said sputtering cathode structure. 4,401,539, Cl. 204-192.00R.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Sakakibara, Susumu; Abe, Ryozo; and Sano, Yasushi, 4,402,070, Cl. 369-43.000.

Abe, Tadashi, to Konishiroku Photo Industry Co., Ltd. Mirror device of copying machine or the like. 4,401,384, Cl. 355-11.000.

Abell, R. Bruce; and Woodruff, Richard K., to Refractory Products Co. Method of making thermal-insulating module. 4,401,613, Cl. 264-108.000.

Abels, Theodor: *See*—
Moranduzzo, Giampaolo; Abels, Theodor; and Stuhr, Hans-Waldemar, 4,400,939, Cl. 60-431.000.

ACF Industries, Incorporated: *See*—
Whaley, William L., 4,401,292, Cl. 251-172.000.

Acher, Jacques: *See*—
Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, 4,401,822, Cl. 548-567.000.

Acheson Industries, Inc.: *See*—
Kratzer, Terry L., 4,401,579, Cl. 252-17.000.

Achtstaetter, Gerhard, to ITT Industries, Inc. Monolithic integrated vertical-deflection circuit for television sets with tangent-corrected, line-frequency-derived digital signal generation. 4,401,921, Cl. 315-364.000.

Adams, Francis J.; Child, Robert P.; and Charles, Barry G., to Thorn Emi Domestic Electrical Appliances Limited. Aerated drinks machine. 4,401,016, Cl. 99-323.100.

Adams, John T.; and Nelson, Marvin D., to Honeywell Inc. Energy saving thermostat with means to shift offset time program. 4,401,262, Cl. 236-46.00R.

Adams, William A.; and Reinhardt, Victor S., to United States of America, National Aeronautics and Space Administration. High stability amplifier. 4,401,953, Cl. 330-289.000.

Adoline, Louis J. Automatic fishing apparatus. 4,400,902, Cl. 43-15.000.

Advanced Micro Devices, Inc.: *See*—
Ochi, Sam S., 4,401,901, Cl. 307-362.000.

Advanced Semiconductor Materials/AM.: *See*—
Engle, George M., 4,401,507, Cl. 156-643.000.

Advanced Semiconductor Materials America: *See*—
Rosler, Richard S.; and Engle, George M., 4,401,687, Cl. 427-38.000.

Advant Corporation: *See*—
Record, Grant C., 4,401,351, Cl. 339-17.0LM.

Agence National de Valorisation de la Recherche (ANVAR): *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, 4,401,659, Cl. 424-177.000.

Agency of Industrial Science & Technology: *See*—
Yabe, Akira; Mori, Yasuo; and Hijikata, Kunio, 4,401,148, Cl. 165-1.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,401,751, Cl. 430-375.000.

Agfa-Gevaert N.V.: *See*—
Vaes, Jos A.; and De Prijcker, Jozef P., 4,401,753, Cl. 430-502.000.

Ahnemiller, James, to Uniroyal, Inc. Method for preparing polyester foam using cobalt/potassium promotors. 4,401,771, Cl. 521-121.000.

Aiba, Masahiko; Yamamoto, Yoichi; Iwai, Hiroji; and Umeda, Ikuo, to Sharp Kabushiki Kaisha. Nozzle cleaning device in an ink jet system printer. 4,401,990, Cl. 346-75.000.

Aiken, John A., Jr.; and Shipp, Kenneth O., Jr., to International Business Machines Corporation. Keyboard mismatch correction. 4,402,058, Cl. 364-900.000.

Aircraft Dynamics Corporation: *See*—
Jones, Jack D.; and Glover, Russell K., Jr., 4,401,346, Cl. 292-144.000.

Aiuchi, Susumu: *See*—
Abe, Katsuo; Kobayashi, Shigeru; Kamei, Tsuneaki; Tateishi, Hideki; and Aiuchi, Susumu, 4,401,539, Cl. 204-192.00R.

Aker, John L.: *See*—
Spigarelli, Rudolph D.; Aker, John L.; and Berry, Fred M., 4,401,035, Cl. 105-61.000.

Akerman, Ake: *See*—
Aslund, Christer; Akerman, Ake; Eriksson, Hans; and Flodin, Benny, 4,401,723, Cl. 428-554.000.

Akzona Incorporated: *See*—
Richmond, James M., 4,401,577, Cl. 252-8.800.

Albany International Corp.: *See*—
Cannon, Frederick W., 4,401,137, Cl. 139-383.00A.
Funkhouser, William A., 4,401,266, Cl. 239-7.000.

Albin, Scott R., to Remington Arms Company, Inc. Vertical ink metering apparatus. 4,401,032, Cl. 101-363.000.

Albizzati, Enrico; Bassi, Ivano; Foschini, Giorgio; Parodi, Sandro; and Pirinoli, Franco, to Montedison S.p.A. Process for preparing catalyst carrier of magnesium chloride. 4,401,641, Cl. 423-498.000.

Alcock, A. John: *See*—
Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, 4,401,920, Cl. 315-150.000.

Alexander, Douglas E.; and McCray, Charles M., to International Business Machines Corp. Printer ribbon cassette and feed mechanism. 4,401,393, Cl. 400-208.000.

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Alexander, Warren R.: *See*—
Hartung, Russell M.; Appleman, Larry; and Alexander, Warren R., 4,402,038, Cl. 362-20.000.

Ali, Khayyam; and Spector, George. Match panel striker. 4,401,438, Cl. 44-45.000.

Ali, Muhammad A. Method of and apparatus for measuring in situ, the sub-surface bearing strength, the skin friction, and other sub-surface characteristics of the soil. 4,400,970, Cl. 73-9.000.

Align-Tech, Inc.: *See*—
Specktor, Gerald A., 4,400,969, Cl. 72-457.000.

Alink, Aloysius J. W. O., to Thomassen Holland B. V. Method and installation for preparing a combustible gas mixture. 4,401,440, Cl. 48-61.000.

Allen, David T.: *See*—
Johnson, Stanley J.; Allen, David T.; and Baker, Keith R., 4,401,403, Cl. 414-335.000.

Allen, John J., Jr.: *See*—
Newton, Ronald O.; Shute, Bruce W.; and Allen, John J., Jr., 4,402,047, Cl. 364-426.000.

Allied Corporation: *See*—
Simmonds, Richard S.; and Owen, Wells P., 4,401,652, Cl. 424-101.000.
Tajkowski, Edward G.; and Colbert, Aaron, 4,401,584, Cl. 252-194.000.

Allis-Chalmers Corporation: *See*—
Huhman, Michael L.; and James, Larry R., 4,400,930, Cl. 56-11.600.
Londres, Manuel P., 4,400,992, Cl. 74-501.00R.

Allmacher, Daniel S., Jr. Accumulating conveyor system. 4,401,208, Cl. 198-781.000.

Almeraz, Efren M. Roller skate. 4,401,311, Cl. 280-11.1BR.

Alonso, Ferdinand. Feeding bottle for infants. 4,401,224, Cl. 215-11.00B.

Alspaugh, Thomas R.: *See*—
Slater, Harold E.; and Alspaugh, Thomas R., 4,401,100, Cl. 126-362.000.

Alter, Bernard; and Rhyme, Fred. Mounting harness for an amusement ball device. 4,400,907, Cl. 46-32.000.

Alvarez, Jose A. A., to T & R Chemicals, Inc. Anticoagulant methods with sulfur dioxide. 4,401,654, Cl. 424-162.000.

Alvarez, Jose A. A., to T & R Chemicals, Inc. Antithrombotic treatment with salts of sulfites and bisulfites. 4,401,655, Cl. 424-162.000.

Amano, Itaru; and Fujieda, Yasuhiko, to Kobe Steel, Ltd. Chuck assembly in a loader of a tire vulcanizer for conveying and inserting green tires. 4,401,422, Cl. 425-38.000.

AMAX Inc.: *See*—
Neelameggham, Ramaswami; and Priscu, John C., 4,401,465, Cl. 75-58.000.

AMCA International Limited: *See*—
Epps, Fred A., 4,400,963, Cl. 72-250.000.

American Cyanamid Company: *See*—
Arthen, Frank J., Jr.; and Manfre, Robert J., 4,401,585, Cl. 252-188.3CL.
Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,401,661, Cl. 424-180.000.

American Home Products Corporation: *See*—
Kim, Dong H.; and Bell, Stanley C., 4,401,832, Cl. 564-347.000.

American Standard Inc.: *See*—
Darrow, John O. G., 4,401,970, Cl. 340-47.000.

Gerken, Carl F., 4,401,033, Cl. 104-94.000.

Ammerling, Willi J.; and Muller, Alfred, to SMS Schloemann-Siemag Aktiengesellschaft. Apparatus for coiling and cooling wire rod. 4,401,294, Cl. 266-112.000.

AMP Incorporated: *See*—
Heisey, Jay M., 4,401,352, Cl. 339-17.0CF.

Ampex Corporation: *See*—
O'Gwynn, David C., 4,401,923, Cl. 318-6.000.

Amtel Communications, Inc.: *See*—
Curtin, William J.; Henning, Paul N.; and Post, Kendall E., 4,401,856, Cl. 179-27.0FH.

Analogic Corporation: *See*—
Beerman, Henry P., 4,401,910, Cl. 310-369.000.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Apparatus for granulating plastics material or plastic compositions. 4,401,421, Cl. 425-71.000.

Anders, Gene A.; Larson, Herbert J.; and Miller, Charles R., to Caterpillar Tractor Co. Heat exchanger core with end covers. 4,401,154, Cl. 165-151.000.

Anderson, Glenn W.; and Hutchison, Stanley O., to Chevron Research Company. Dome-type packoff wellhead. 4,401,160, Cl. 166-88.000.

Anderson, Kurt M.; and Morehouse, James, to Storage Technology Corporation. Servo read/write head arm assembly for magnetic disk drive. 4,402,025, Cl. 360-98.000.

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Andra, Klaus; Hutschenreuter, Elfriede; and Seifried, Walter, to Hoechst Aktiengesellschaft. Tubular casing with glued seam and process for its manufacture. 4,401,135, Cl. 138-118.100.

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Muller, Peter, 4,401,744, Cl. 430-179.000.

Angehrn, Jorg A., to Dresser Industries Inc. Method and apparatus for acoustic well logging. 4,402,068, Cl. 367-26.000.

Anjou, Gunnar, to Safe Package AB. Child-proof container. 4,401,210, Cl. 206-1.500.

Ankrapp, John H.; Holzen, Donald J.; and Rinke, Donald F., to General Motors Corporation. Window reveal molding. 4,401,340, Cl. 296-93.000.

Antonaccio, Michael J.: *See*—
Greenberg, Roland; Cushman, David W.; Vogt, B. Richard; Weisenborn, Frank L.; and Antonaccio, Michael J., 4,401,677, Cl. 424-317.000.

Antypas, George A.; Bell, Ronald L.; and Moon, Ronald L., to Varian Associates, Inc. Method of making a transparent and electrically conductive bond. 4,400,868, Cl. 29-572.000.

Aoki, Keiji; and Ikeda, Shinji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronically controlled fuel injection method and apparatus. 4,401,079, Cl. 123-435.000.

Aoki, Tadashi: *See*—
Suzuki, Yoshiro; Yasuda, Tadahiro; Nishikawa, Masaji; Sato, Eiichi; and Aoki, Tadashi, 4,401,383, Cl. 355-3.0TR.

Aoki, Takashi: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, 4,401,180, Cl. 180-148.000.

Aoyagi, Akira; Sakata, Kazuomi; Ikeda, Shinichi; and Koyama, Mashiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for detecting abnormal conditions of switch gears. 4,400,981, Cl. 73-862.510.

Aoyagi, Takaaki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Ishii, Shinichi; Saino, Tetsushi; and Someno, Tetsuya, 4,401,594, Cl. 260-112.50R.

Aoyama, Toshihiko: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, 4,401,180, Cl. 180-148.000.

Appleman, Larry: *See*—
Hartung, Russell M.; Appleman, Larry; and Alexander, Warren R., 4,402,038, Cl. 362-20.000.

Appleton Mills: *See*—
Beck, David A.; and Schultz, Gary V., 4,401,147, Cl. 162-263.000.

Arai, Kozo; Suzuki, Takao; and Umetsu, Syozo, to Showa Aluminium Kabushiki Kaisha. Aluminum alloy foils for cathodes of electrolytic capacitors. 4,401,489, Cl. 148-438.000.

Arakawa, Hideki, to Fujitsu Limited. Nonvolatile memory. 4,402,064, Cl. 365-185.000.

Arakawa, Masatoshi; and Nakazawa, Kazuyoshi, to Japan Synthetic Rubber Co., Ltd. Process for producing 1,3-butadiene or 2-methyl-1,3-butadiene having high purity. 4,401,515, Cl. 203-25.000.

Arakawa, Takeshi: *See*—
Matsuoka, Mitsutoshi, 4,401,606, Cl. 261-93.000.

Arasawa, Kohichi: *See*—
Takano, Toshio; Mihashi, Kazutaka; and Arasawa, Kohichi, 4,401,199, Cl. 192-0.052.

Arbie, John A., Sr., to GTE Products Corporation. Method for deagglomerating sintered phosphors. 4,401,276, Cl. 241-29.000.

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Arena, Blaise J., to UOP Inc. Hydrogenolysis of polyhydroxylated compounds. 4,401,823, Cl. 549-356.000.

Argus Chemical Corporation: *See*—
Bae, Kook J.; and Brecker, Lawrence R., 4,401,779, Cl. 524-114.000.

Aristoff, Paul A., to Upjohn Company, The. Benzopyran compounds, derivatives of prostaglandins. 4,401,824, Cl. 549-385.000.

Armour Pharmaceutical Company: *See*—
Orlowski, Ronald C.; and Seyler, Jay K., 4,401,593, Cl. 260-112.50T.

Armstrong World Industries, Inc.: *See*—
Koontz, Ernest T., Jr., 4,401,496, Cl. 156-182.000.

Arndt, Klaus, to Contraves AG. Apparatus for locking a drive shaft for the elevation or azimuth sighting movements of the sighting device of an observation periscope. 4,401,193, Cl. 188-69.000.

Arnold, James F. Floating roof tank seal. 4,401,306, Cl. 277-34.300.

Arp, Leon J. Blood pump and oxygenator monitor-controller and display device. 4,401,431, Cl. 604-4.000.

Arrigoni, John P., to United Technologies Corporation. Fixture for restoring a face on the shroud of a rotor blade. 4,400,915, Cl. 51-217.00R.

Arthen, Frank J., Jr.; and Manfre, Robert J., to American Cyanamid Company. Bis(p-alkylphenylethynyl)anthracene. 4,401,585, Cl. 252-188.3CL.

Asada, Akihiro: *See*—
Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, 4,401,971, Cl. 340-52.00F.

Asahi-Dow Limited: *See*—
Hiyoshi, Kazuhiko; and Sugizaki, Atsushi, 4,401,788, Cl. 524-714.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Ohmura, Kaoru; Koyama, Ryohei; and Kimura, Takeo, 4,401,521, Cl. 204-12.000.
Ohmura, Kaoru; Matsuura, Masaru; Matsui, Takeki; and Kimura, Takeo, 4,401,966, Cl. 338-32.00R.

Asano, Seiichi: *See*—
Watabe, Tomiji; Kondo, Hideo; Okuda, Kyokai; Yano, Kenji; and Asano, Seiichi, 4,400,940, Cl. 60-502.000.

ASEA Aktiebolag: *See*—
Carlstedt, Anders; and Nilsson, Ake, 4,400,957, Cl. 72-8.000.
Korostenski, Milan, 4,401,591, Cl. 252-629.000.
Larker, Hans, 4,401,728, Cl. 428-614.000.

Aslund, Christer; Akerman, Ake; Eriksson, Hans; and Flodin, Benny, to Granges NYBY AB. Capsules and pressings for extruding objects, particularly tubes, and a process for producing the capsules and pressings. 4,401,723, Cl. 428-554.000.

Ataka, Kikuo: *See*—
Umumura, Sumio; Iwata, Fumio; Ataka, Kikuo; and Shiraishi, Hiroshi, 4,401,830, Cl. 562-478.000.

Athenes, Claude; and Salle, Jacques E., to Thomson-CSF Telephone. Signalling switching system in a time switching network and time switching network incorporating such a system. 4,402,078, Cl. 370-66.000.

Atherton, Kim W.: *See*—
Hanson, Richard A.; and Atherton, Kim W., 4,400,979, Cl. 73-517.00B.

Atlantic Richfield Company: *See*—
Bonnecaze, Bernard F., 4,401,436, Cl. 44-1.00G.
McGarr, John W., 4,400,975, Cl. 73-204.000.
Pyle, Bruce D., 4,401,839, Cl. 136-251.000.
Sun, Hsiang-ning, 4,401,633, Cl. 423-118.000.
Sun, Hsiang-ning, 4,401,634, Cl. 423-118.000.
Yerkes, John W., 4,401,935, Cl. 320-9.000.

Atsugi Motor Parts Company, Limited: *See*—
Ishikawa, Hiroshi; and Satake, Sachio, 4,401,310, Cl. 280-6.100.

Atwater, Charles B. Buffered solutions which have a reduced corrosive nature. 4,401,624, Cl. 422-12.000.

Atwood Vacuum Machine Company: *See*—
Swanson, David L.; and Lyons, Dale E., 4,400,986, Cl. 74-128.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Schmidt, Hans T., 4,401,343, Cl. 297-284.000.

Audibert, Francoise: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, 4,401,659, Cl. 424-177.000.

Auer, John H., Jr.: *See*—
Parker, John W.; and Auer, John H., Jr., 4,402,034, Cl. 361-208.000.

Augat Inc.: *See*—
McDevitt, John E., Jr.; and Petersen, Richard W., 4,401,353, Cl. 339-18.00C.

Augis, Jacques A.; and Eisenmann, Erhard T., to Bell Telephone Laboratories, Incorporated. Process for producing gold plated contacts. 4,401,524, Cl. 204-37.00R.

Auras, Alain G. Wind-propelled craft. 4,401,047, Cl. 114-39.000.

Austin, Kenneth A. Collapsible magnus-effect rotor. 4,401,284, Cl. 244-21.000.

Australian Hop Marketers Pty. Ltd.: *See*—
Versluys, Jan P., 4,401,684, Cl. 426-546.000.

Automated Packaging Systems, Inc.: *See*—
Lerner, Bernard, 4,401,213, Cl. 206-205.000.

Avco Everett Research Laboratory, Inc.: *See*—
Gnanamuthu, Daniel S., 4,401,726, Cl. 428-610.000.

Avellone, Richard C., to Republic Steel Corporation. Apparatus and method for plating metallic strip. 4,401,523, Cl. 204-15.000.

Axelrod, Robert J.; Liberti, Frank N.; and Semen, John, to General Electric Company. Process for increasing the rate of crystallization of polyesters. 4,401,792, Cl. 525-175.000.

Ayerst, McKenna & Harrison Inc.: *See*—
Eng, Chee P., 4,401,653, Cl. 424-114.000.

Ayerst, McKenna & Harrison, Ltd.: *See*—
Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., 4,401,656, Cl. 424-177.000.

B.A.T., Cigaretten-Fabriken GmbH: *See*—
Wiethaup, Wolfgang, 4,400.972, Cl. 73-38.000.

B. F. Goodrich Company, The: *See*—
Nehmey, Sam D.; and Summers, James W., 4,401,612, Cl. 264-53.000.

Baba, Kazuo, to Olympus Optical Co., Ltd. Endoscope having an ultrasonic diagnosis function. 4,401,123, Cl. 128-660.000.

Babish, John G.: *See*—
Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, 4,401,666, Cl. 424-245.000.

Babjak, Juraj: *See*—
Ettell, Victor A.; and Babjak, Juraj, 4,401,630, Cl. 423-34.000.

Backlund, Sven; and Grimm, Forrest R., to Minnesota Mining and Manufacturing Company. Thermal switch. 4,401,965, Cl. 337-408.000.

Badger R. Bazen Co., Inc.: *See*—
Bazen, Badger R., 4,401,150, Cl. 165-47.000.

Bae, Kook J.; and Brecker, Lawrence R., to Argus Chemical Corporation. Homogeneous liquid barium carbonate-barium alkyl phenatecadmium carboxylate stabilizer systems for rigid polyvinyl chloride resins. 4,401,779, Cl. 524-114.000.

Baermann, Horst; and Dibos, Otmar, to Rheinmagnet Horst Baermann KG. Permanent magnetic holding arrangement, particularly for temporary holding of ferro-magnetic parts. 4,401,961, Cl. 335-285.000.

Bahr, Theodor: *See*—
Thumm, Helmut; Bahr, Theodor; and Henrich, Hans, 4,401,277, Cl. 241-38.000.

Bailey, David A.: *See*—
Dolland, Carlisle R.; and Bailey, David A., 4,401,934, Cl. 318-798.000.

Bailey, George K.; Holroyd, Eric; Wright, Anthony R.; and Perkins, David J. B., to W & A Bates Limited. Reinforced structures. 4,401,493, Cl. 156-117.000.

Bailey, Milton; Spindola, Kenneth; and Bernstein, Sumner H., to United States of America, Navy. Composite heat protective fabric. 4,401,707, Cl. 428-166.000.

Baker International Corporation: *See*—
Spencer, Jack D.; and Donovan, Joseph F., 4,401,158, Cl. 166-51.000.
Stone, Lyndon R.; and Hall, James D., 4,402,052, Cl. 364-506.000.

Baker, Keith R.: *See*—
Johnson, Stanley J.; Allen, David T.; and Baker, Keith R., 4,401,403, Cl. 414-335.000.

Baker, Rex O. Rodent bait station. 4,400,904, Cl. 43-131.000.

Baldelli, Massimo, to Ceramiche di Riosecco dei Figli de Dante Baldelli & C. S.n.c. Mechanism for rapid and hermetic closing of ceramic containers. 4,401,228, Cl. 220-235.000.

Baldwin, Wilbur A.; Silverman, Richard; Jezorek, Leigh; and Pitel, Irving, to Roto Form Sales Corp. Lead trimmer for printed circuit boards. 4,401,003, Cl. 83-483.000.

Balogh, George F., to Goodyear Tire & Rubber Company, The. Purification of hydrocarbons by treatment with polyamines. 4,401,838, Cl. 585-860.000.

Ban, Vladimir S., to RCA Corporation. Radiation heated reactor process for chemical vapor deposition on substrates. 4,401,689, Cl. 427-45.100.

Bansemir, Horst; and Buchs, Wolfgang, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Solar cell carrier membrane comprising a fabric composed of plastic bands reinforced by aramide fibers. 4,401,710, Cl. 428-229.000.

Barbieri, Louis C. Apparatus for reforming deformed container structures and the like. 4,400,968, Cl. 72-457.000.

Barbour, William P., to DBS, Inc. Credit card imprinter with card-sensing form insertion interlock. 4,401,029, Cl. 101-269.000.

Barda, Henry J.; and Lesniewski, Joseph M., to Saytech, Inc. Flame retardant thermoplastic compositions. 4,401,778, Cl. 524-89.000.

Bardong, Helmut: *See*—
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,400,860, Cl. 29-157.00R.

Bare, Rex O., to C. R. Bard, Inc. Electrical terminal. 4,401,356, Cl. 339-258.00R.

Baresh, Joseph M.; Hisey, Elmer; and Nash, Robert E., to Boeing Company, The. Skin contour inspection system. 4,400,884, Cl. 33-174.0PA.

Bargeton, Gilbert L.; and Beynie, Claude P., to Societe Anonyme de Tele Communication. Step-by-step remote locating system for repeaters in a PCM link. 4,402,075, Cl. 370-15.000.

Barker, Raymond H., Jr.: *See*—
Simmons, Donald E.; Barker, Raymond H., Jr.; and Walter, Kenneth D., 4,401,337, Cl. 294-81.0SF.

Barlow, Harold E. M., to National Research Development Corporation. Optical waveguide and method of propagating waves therein. 4,401,363, Cl. 350-96.300.

Baron, Bill N.; Rocheleau, Richard E.; and Russell, T. W. Fraser, to University of Delaware, The. Apparatus for continuous deposition by vacuum evaporation. 4,401,052, Cl. 118-718.000.

Barrera, Giorgio, to Officine Meccaniche Pavesi & C. S.p.A. Method for placing prewound coils in stator slots. 4,400,871, Cl. 29-596.000.

Barrett, Marlin W.: *See*—
Roseman, Michael P.; Eames, Richard C.; and Barrett, Marlin W., 4,401,204, Cl. 198-431.000.

Bartlett, Charles R.: *See*—
Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., 4,401,486, Cl. 148-154.000.

Barton, Derek H.; Motherwell, William B.; and Zard Zard, Samir, to Roussel Uclaf. Novel 17-oxazoline-steroids. 4,401,596, Cl. 260-239.550.

Bartosevich, Joseph F.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,401,670, Cl. 424-250.000.

Bartow, Richard J., to Clark Equipment Company. Upright for lift truck. 4,401,191, Cl. 187-9.00E.

Basawapatna, Ganesh R., to Microsource, Inc. Microwave switched amplifier/multiplier. 4,401,952, Cl. 330-277.000.

BASF Aktiengesellschaft: *See*—
Hibst, Hartmut; and Jakusch, Helmut, 4,401,643, Cl. 423-594.000.
Hoffmann, Gerhard; and Richter, Peter, 4,401,749, Cl. 430-271.000.
Lotsch, Wolfgang; Kemper, Reinhard; Bock, Gustav; and Elser, Wolfgang, 4,401,815, Cl. 544-300.000.
Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, 4,401,637, Cl. 423-329.000.
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, 4,401,545, Cl. 204-291.000.
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,401,821, Cl. 548-374.000.

Baskett, Theodore N. Surface processing method. 4,401,699, Cl. 427-445.000.

Bassi, Ivano: *See*—
Albizzati, Enrico; Bassi, Ivano; Foschini, Giorgio; Parodi, Sandro; and Pirinoli, Franco, 4,401,641, Cl. 423-498.000.

Bastiaens, Jozef J. J.: *See*—
Vorst, Henricus H. M.; Bastiaens, Jozef J. J.; and Munk, Enno C., 4,401,992, Cl. 346-76.00L.

Batchelder, J. Samuel. Method and apparatus for dielectrophoretic storage and retrieval of information. 4,402,062, Cl. 365-153.000.

Bates, Andrew J.: *See*—
Alexander, Roger D.; and Bates, Andrew J., 4,401,490, Cl. 149-2.000.

Battelle Development Corporation: *See*—
Clauer, Allan H.; Fairand, Barry P.; Ford, Stephen C.; and Walters, Craig T., 4,401,477, Cl. 148-4.000.

Battista, Orlando A. Expandable low calorie compositions. 4,401,682, Cl. 426-285.000.

Battles, James E.: *See*—
Otto, Neil C.; Warner, Barry T.; Smaga, John A.; and Battles, James E., 4,401,714, Cl. 429-221.000.

Bauer, Hannsgeorg: *See*—
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Baugh, Benton F. In situ method and apparatus for inspecting and repairing subsea wellheads. 4,401,164, Cl. 166-379.000.

Baxter, Andrew J. G.; Roberts, Patricia M.; and Southgate, Robert, to Beecham Group Limited. 4-Allyl azetidinone intermediate for β-lactam antibacterial agents. 4,401,595, Cl. 260-239.00A.

Baxter Travenol Laboratories, Inc.: *See*—
Figler, Alan A., 4,401,981, Cl. 340-715.000.

Bayer Aktiengesellschaft: *See*—
Pedain, Josef; Thoma, Wilhelm; Grammel, Jurgen; and Schroer, Walter, 4,401,801, Cl. 528-67.000.
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,401,802, Cl. 528-167.000.
Schnegg, Ulrich; and Wedemeyer, Karlfried, 4,401,833, Cl. 564-412.000.
Wenzel, Wolfgang; and Meckel, Walter, 4,401,786, Cl. 524-591.000.

Bayly Engineering Limited: *See*—
Krajewski, Zdzislaw A. A., 4,402,076, Cl. 370-30.000.

Bayusik, John G.: *See*—
Fuzesi, Stephen; and Bayusik, John G., 4,401,772, Cl. 521-167.000.

Bazen, Badger R., to Badger R. Bazen Co., Inc. Polymer cooling can. 4,401,150, Cl. 165-47.000.

BBC Brown, Boveri & Company Limited: *See*—
Oplatka, Georg, 4,400,946, Cl. 60-641.800.

Bear Medical Systems, Inc.: *See*—
Fry, Stanley E.; and Hurd, Claude C., 4,401,116, Cl. 128-205.240.

Beaumont, Ronald E., to Jordan & Ste-Michelle Cellars Ltd. Production of wine. 4,401,678, Cl. 426-15.000.

Beck, David A.; and Schultz, Gary V., to Appleton Mills. Portable instrument for measuring the permeability of a papermaker's felt. 4,401,147, Cl. 162-263.000.

Becker, Kunibert; Elsner, Burckhard; and Dunkel, Gerd, to Gewerkschaft Eisenhutte Westfalia. Two part mine roof support unit. 4,401,399, Cl. 405-299.000.

Becton Dickinson and Company: *See*—
Wilner, L. Bruce; and Wong, Herbert V., 4,400,869, Cl. 29-576.00C.

Beecham Group Limited: *See*—
Baxter, Andrew J. G.; Roberts, Patricia M.; and Southgate, Robert, 4,401,595, Cl. 260-239.00A.
Dowrick, John S., 4,401,674, Cl. 424-271.000.

Beerman, Henry P., to Analogic Corporation. Multi-focus spiral ultrasonic transducer. 4,401,910, Cl. 310-369.000.

Beiersdorf Aktiengesellschaft: *See*—
Cohnen, Erich, 4,401,831, Cl. 564-221.000.

Belart, Juan, to ITT Industries, Inc. Brake unit for automotive vehicles. 4,400,943, Cl. 60-554.000.

Bell, Aurel L.: *See—*
Bell, Dwain C.; and Bell, Aurel L., 4,400,911, Cl. 49-55.000.

Bell, Dwain C.; and Bell, Aurel L., to Bell Manufacturing & Services, Inc. Adjusting window security grill. 4,400,911, Cl. 49-55.000.

Bell, John P., to United States of America, Environmental Protection Agency. High volume particle collector and fractionator. 4,400,982, Cl. 73-863.220.

Bell Manufacturing & Services, Inc.: *See—*
Bell, Dwain C.; and Bell, Aurel L., 4,400,911, Cl. 49-55.000.

Bell, Richard L.; and Helms, Charles R., to Container Corporation of America. Carton tray and lid with membrane sealing-hinging arrangement. 4,401,229, Cl. 220-259.000.

Bell, Ronald L.: *See—*
Antypas, George A.; Bell, Ronald L.; and Moon, Ronald L., 4,400,868, Cl. 29-572.000.

Bell, Stanley C.: *See—*
Kim, Dong H.; and Bell, Stanley C., 4,401,832, Cl. 564-347.000.

Bell Telephone Laboratories, Incorporated: *See—*
Augis, Jacques A.; and Eisenmann, Erhard T., 4,401,524, Cl. 204-37.00R.
Braun, Arthur R.; and Poignant, Robert E., 4,401,861, Cl. 179-175.30R.
Fraser, David B., 4,400,867, Cl. 29-571.000.
Green, Martin L.; and Sherwood, Richard C., 4,401,482, Cl. 148-104.000.
Jin, Sungho, 4,401,483, Cl. 148-120.000.
Jirka, Howard F., 4,402,039, Cl. 363-21.000.
Steele, Raymond, 4,401,854, Cl. 179-1.50R.
Teraslinna, Kari T., 4,402,008, Cl. 358-86.000.
Walls, Jim E., 4,401,860, Cl. 179-175.20C.
Wittwer, Norman C., 4,402,063, Cl. 365-154.000.

Bellehache, Pierre; and Houdan, Jean M., to Societe de Machines pour la Transformation des Plastiques. Apparatus for blow molding hollow plastic bodies. 4,401,423, Cl. 425-210.000.

Bendix Corporation, The: *See—*
Caruso, Peter J., 4,401,973, Cl. 340-345.000.
Haase, Elmer A., 4,401,063, Cl. 123-73.00B.
O'Keefe, Patrick J., Jr.; Schubert, Frank R.; and Rini, Guy T., 4,401,075, Cl. 123-352.000.

Benham, Albert A., to Champion International Corp. Multiple pocket, expandable envelope, and blank and method for forming same. 4,401,257, Cl. 229-72.000.

Benn, Raymond C.; Mihalisin, John R.; Curwick, Leroy R.; and Merrick, Howard F., to International Nickel Co., Inc., The; and Howmet Corporation. Nickel-chromium-iron alloy. 4,401,622, Cl. 420-449.000.

Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., to Mobil Oil Corporation. Thermoplastic bags and method of making. 4,401,427, Cl. 493-199.000.

Benoy, David C., to Loewy Robertson Engineering Co. Ltd. Strip material outer turn proximity switch detection apparatus. 4,401,865, Cl. 200-61.130.

Bergandy, Wieslaw: *See—*
Rosen, Robert; and Bergandy, Wieslaw, 4,401,141, Cl. 141-192.000.

Berges, David E., to General Electric Company. Method of and apparatus for skewing a stack of laminations. 4,400,872, Cl. 29-598.000.

Berggren, Benny; and Boling, Goran, to Stiftelsen Institutet For Mikrovagsteknik. Microwave heating device with tapered waveguide. 4,401,873, Cl. 219-10.55A.

Berke, Neal S.; and Townsend, Herbert E., to Bethlehem Steel Corporation. Ferrous product having an alloy coating thereon of Al-Zn-Mg-Si Alloy, and method. 4,401,727, Cl. 428-610.000.

Bernstein, Seymour: *See—*
Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,401,661, Cl. 424-180.000.

Bernstein, Sumner H.: *See—*
Bailey, Milton; Spindola, Kenneth; and Bernstein, Sumner H., 4,401,707, Cl. 428-166.000.

Berry, Fred M.: *See—*
Spigarelli, Rudolph D.; Aker, John L.; and Berry, Fred M., 4,401,035, Cl. 105-61.000.

Berry, Uylsses. Cooking apparatus. 4,401,018, Cl. 99-420.000.

Bertok, Vladimir: *See—*
Torbica, Ratko; and Bertok, Vladimir, 4,401,409, Cl. 415-211.000.

Bertolacini, Ralph J.: *See—*
Pellet, Regis J.; Bertolacini, Ralph J.; and Lysholm, Donna L., 4,401,558, Cl. 208-139.000.

Best, John S.; and Sanders, Ian L., to International Business Machines Corporation. Gap tolerant merge element for contiguous-disk bubble devices. 4,402,060, Cl. 365-36.000.

Bethlehem Steel Corporation: *See—*
Berke, Neal S.; and Townsend, Herbert E., 4,401,727, Cl. 428-610.000.
Smith, Anthony R., 4,401,237, Cl. 222-56.000.

Bevillard, Jean G., to Klaxon, S.A. Acoustic warning device. 4,401,049, Cl. 116-142.0FP.

Beyl, Jean J. A., to Ste Look. Toe abutment member for a ski binding. 4,401,318, Cl. 280-630.000.

Beynie, Claude P.: *See—*
Bargeton, Gilbert L.; and Beynie, Claude P., 4,402,075, Cl. 370-15.000.

Bezman, Richard D.; and Rabo, Jule A., to Union Carbide Corporation. Midbarrel hydrocracking. 4,401,556, Cl. 208-111.000.

BICC Limited: *See—*
Slaughter, Raymond J., 4,401,361, Cl. 350-96.230.

Bickel, Hansjorg: *See—*
Bloch, Peter; and Bickel, Hansjorg, 4,400,916, Cl. 51-287.000.

Bigalke, Erhard: *See—*
Heidemeyer, Paulus; Bigalke, Erhard; Zimmermann, Frank; and Werner, Hartmut, 4,401,200, Cl. 192-0.076.

Billings, John S., Jr.: *See—*
Meyer, Jeffry R.; Billings, John S., Jr.; Spindle, Harvey E.; and Hofmann, Charles F., 4,401,841, Cl. 174-31.00R.

Bindschatel, Lyle D. Door and jamb mortising pilot. 4,400,886, Cl. 33-197.000.

Binks Manufacturing Company: *See—*
Pomponi, Edward A., Jr., 4,401,268, Cl. 239-142.000.

Binner, Tihamer S. Solar and standby fireplace system. 4,401,106, Cl. 126-450.000.

Biomedical Labs.: *See—*
Dorson, William J., Jr.; and Pizziconi, Vincent B., 4,401,430, Cl. 604-4.000.

Birk, John R.: *See—*
Kelley, Robert B.; Birk, John R.; and Chen, Nai-Yung, 4,402,053, Cl. 364-513.000.

Bittar, Joseph, to Otis Elevator Company. Cars/floors and calls/cars elevator assignments. 4,401,190, Cl. 187-29.00R.

Bjerre, Poul: *See—*
Rubin, Jan; and Bjerre, Poul, 4,401,679, Cl. 426-36.000.

Blackstone, Ralf W. Cervical spine collar. 4,401,111, Cl. 128-75.000.

Blades, Frederick K., to PureCycle Corporation. Ultrasonic transceiver circuit for level sensing. 4,400,976, Cl. 73-290.00V.

Blair, Mark A., to Ford Motor Company. Quick-connect tubular coupling. 4,401,326, Cl. 285-318.000.

Blais, Marcel H.: *See—*
Corna, John F.; and Blais, Marcel H., 4,400,834, Cl. 4-506.000.

Blanchard, Richard A., to Supertex, Inc. Composite MOS/bipolar power device. 4,402,003, Cl. 357-43.000.

Blatt, David H., to Franklin Container Corporation. Roll retainer. 4,401,217, Cl. 206-408.000.

Bloch, Peter; and Bickel, Hansjorg, to Maag Gear-Wheel & Machine Company Limited. Indexing generating method for grinding gears. 4,400,916, Cl. 51-287.000.

Bloise, Rene; Morizot, Georges; and Boissonnade, Genevieve, to Bureau de Recherches Geologiques et Minieres. Method for obtaining senarmontite and senarmontite thus obtained. 4,401,644, Cl. 423-617.000.

Blomgren, Roland A., to Service Master Industries, Inc. Rotary floor cleaner. 4,400,843, Cl. 15-49.00R.

Blomquist, James E.; and Wilczewski, Robert H. Dot matrix print head. 4,401,392, Cl. 400-124.000.

Bloom, Philip A.: *See—*
Madsen, Brent W.; Dolezal, Henry; Bloom, Philip A.; and Shirts, Monte B., 4,401,632, Cl. 423-87.000.

Blum, Alvin S. Photon emission tomographic apparatus. 4,401,890, Cl. 250-363.00S.

Blytas, George C.; and June, Ronald K., to Shell Oil Company. Removal of organic contaminants from waste water. 4,401,570, Cl. 210-639.000.

Blytas, George C.; and Diaz, Zaida, to Shell Oil Company. Froth process. 4,401,642, Cl. 423-573.00G.

Board of Regents for Education for the State of Rhode Island: *See—*
Kelley, Robert B.; Birk, John R.; and Chen, Nai-Yung, 4,402,053, Cl. 364-513.000.

Bobovsky, Vladimir A.: *See—*
Leonov, Alexandr Y.; Matveev, Georgy G.; Morozov, Leonid V.; and Bobovsky, Vladimir A., 4,401,019, Cl. 99-471.000.

Bock, Gustav: *See—*
Lotsch, Wolfgang; Kemper, Reinhard; Bock, Gustav; and Elser, Wolfgang, 4,401,815, Cl. 544-300.000.

Boehm, Hugo: *See—*
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, 4,401,545, Cl. 204-291.000.

Boeing Company, The: *See—*
Baresh, Joseph M.; Hisey, Elmer; and Nash, Robert E., 4,400,884, Cl. 33-174.0PA.
McKinney, Maurice E., 4,401,495, Cl. 156-173.000.
Pond, C. Ray; and Wilbert, Reynold E., 4,401,886, Cl. 250-203.00R.

Boffardi, Bennett P., to Calgon Corporation. Aminomethylphosphonic acid and polymaleic anhydride combinations for treating corrosion. 4,401,587, Cl. 252-389.00A.

Bohla, David J.; and Elliott, Leonard R., to Rockwell International Corporation. Drum brake. 4,401,197, Cl. 188-334.000.

Boichot-Castagne, Bernard; Case, Roger; and Marin-Pache, Reynald, to Merlin Gerin. Operating mechanism of a low voltage electric circuit breaker. 4,401,872, Cl. 200-153.00G.

Boissonnade, Genevieve: *See—*
Bloise, Rene; Morizot, Georges; and Boissonnade, Genevieve, 4,401,644, Cl. 423-617.000.

Boivin, Louis: *See—*
Guay, Raymond; and Moffatt, Pierre R., 4,400,978, Cl. 73-453.000.

Bol, Izya: *See—*
Yeh, Keming W.; and Bol, Izya, 4,400,866, Cl. 29-571.000.

Boling, Goran: *See—*
Berggren, Benny; and Boling, Goran, 4,401,873, Cl. 219-10.55A.

Bond, Irvin D. Straight line link mechanism. 4,400,985, Cl. 74-103.000.

Bonnecaze, Bernard F., to Atlantic Richfield Company. Process for cooling particulate coal. 4,401,436, Cl. 44-1.00G.

Bonomo, Melvin E. Dual delivery hopper discharge apparatus. 4,401,242, Cl. 222-533.000.

Bookout, Charles C.; Heeney, John P.; and Murphy, Richard E., to Ford Motor Company. Four speed overdrive transaxle. 4,400,998, Cl. 74-740.000.

Boon, Raymond: *See—*
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,401,108, Cl. 128-1.100.

Borg-Warner Corporation: *See—*
Gatewood, Sidney U., 4,401,201, Cl. 192-106.200.

Bosco, Peter M.: *See—*
Brown, Gary M.; Bosco, Peter M.; and Danielson, Robert L., 4,401,685, Cl. 426-576.000.

Bosse, Peter S.: *See—*
Webber, Dean A.; and Bosse, Peter S., 4,401,877, Cl. 219-121.0LJ.

Bottenbruch, Ludwig: *See—*
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,401,802, Cl. 528-167.000.

Bouchaudon, Jean; Dutruc-Rosset, Gilles; Farge, Daniel; and James, Claude, to Rhone-Poulenc Sante. Tri-, tetra, and penta-peptides, their preparation and compositions containing them. 4,401,658, Cl. 424-177.000.

Boudin, Daniel; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, to Fonderie et Ateliers des Sablons. Apparatus for locating the level of liquid in a vessel. 4,400,881, Cl. 33-126.70A.

Boulos, Robert: *See—*
Simons, Elliot; and Boulos, Robert, 4,401,118, Cl. 128-207.140.

Bove, Fred, to Plaserco S.A. House construction set. 4,400,906, Cl. 46-21.000.

Bovino, Jerald A.; and Bovino, Joseph A. Fly tackle steamer. 4,401,102, Cl. 126-369.000.

Bovino, Joseph A.: *See—*
Bovino, Jerald A.; and Bovino, Joseph A., 4,401,102, Cl. 126-369.000.

Bowditch, Philip N., to Charles Stark Draper Laboratory, Inc., The. System and method for manufacturing seamed articles. 4,401,044, Cl. 112-262.300.

Bowser, George C.: *See—*
Schneider, Alan A.; Flower, Ronald J.; Bowser, George C.; and Kenyon, Lewis C., 4,401,847, Cl. 179-1.00H.

Boyer, Keith D., to H. H. Robertson Company. Panel mounting clip assembly and wall or roof structure utilizing the same. 4,400,922, Cl. 52-394.000.

Brack, Joe B. Hand held spray can adapter. 4,401,240, Cl. 222-323.000.

Bradshaw, Stephen L.: *See—*
Unsworth, William; King, John F.; and Bradshaw, Stephen L., 4,401,621, Cl. 420-403.000.

Brand, Gunter; Gerber, Richard; Ehrmann, Karl; Kaufmann, Reinhold; and Kaliopke, Harald, to Robert Bosch GmbH. Ignition distributor for internal combustion engines. 4,401,066, Cl. 123-146.50A.

Brander, James E., to International Comustion Australia Limited. Means of energizing vibrating feeders. 4,401,925, Cl. 318-114.000.

Braun, Arthur R.; and Poignant, Robert E., to Bell Telephone Laboratories, Incorporated. Semiconductor crosspoint linearizing arrangement. 4,401,861, Cl. 179-175.30R.

Brausfeld, Walter: *See—*
Rodewald, Gerhard; Opel, Detlef; Brausfeld, Walter; Gottling, Helmut; Meyer, Hans-Friedrich; and Moller, Rudolf, 4,401,293, Cl. 251-324.000.

Bray, Murel B. Pneumatic thread undercutter. 4,401,046, Cl. 112-298.000.

Brazie, Paul D.: *See—*
Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., 4,401,486, Cl. 148-154.000.

Breckenridge, David L. Grasping apparatus and collection vehicle. 4,401,407, Cl. 414-408.000.

Brecker, Lawrence R.: *See—*
Bae, Kook J.; and Brecker, Lawrence R., 4,401,779, Cl. 524-114.000.

Breger, Yves: *See—*
Reigner, Gerard; and Breger, Yves, 4,400,959, Cl. 72-112.000.

Breidenbach, Kurt: *See—*
Lemmer, Helmut; and Breidenbach, Kurt, 4,401,863, Cl. 200-16.00A.

Breitenfellner, Franz, to Ciba-Geigy Corporation. Thermoplastic moulding composition and use thereof. 4,401,784, Cl. 524-424.000.

Breitweg, Werner; and Walter, Wolfgang, to Zahnradfabrik Friedrichshafen, AG. Rack and pinion steering gear, especially for motor vehicles. 4,400,991, Cl. 74-498.000.

Bresnahan, Roger M.; and Jepson, Paul D., to Libbey-Owens-Ford Company. Apparatus and method for handling sheet material. 4,400,841, Cl. 414-564.000.

Brevet AG: *See—*
Haack, Werner, 4,401,177, Cl. 177-250.000.

Brewer, John C. Apparatus for pyrolyzing shredded tires. 4,401,513, Cl. 202-97.000.

Brezinski, Donald P., to Corning Glass Works. Reference electrode with internal diffusion barrier. 4,401,548, Cl. 204-435.000.

Bridger, Robert F., to Mobil Oil Corporation. Intaglio printing ink and method of employing the same. 4,401,470, Cl. 106-20.000.

Bridgestone Tire Co., Ltd.: *See—*
Tsuchiya, Kazuo; Masuda, Hirotsugu; and Sakaguchi, Yuji, 4,401,325, Cl. 285-231.000.

Briecke, Hans-Gunther: *See—*
Marsch, Hans-Dieter; and Briecke, Hans-Gunther, 4,401,153, Cl. 165-134.00R.

Briley, George C.: *See—*
Martin, Walter H.; and Briley, George C., 4,401,449, Cl. 62-59.000.

Briscoe, Terry L.: *See—*
Fillmore, Dale A.; and Briscoe, Terry L., 4,400,933, Cl. 59-84.000.

Bristol-Myers Company: *See—*
Sheinaus, Harold; and Marcus, Arnold D., 4,401,665, Cl. 424-233.000.

Bristol, Robert D. Apparatus for split engine operation. 4,401,068, Cl. 123-198.00F.

British Aerospace Public Limited Company: *See—*
Simmonds, John H. J., 4,401,285, Cl. 244-100.00R.

Britt, Laurence D.; and Britt, Richard G. Phosphorescent escape route indicator. 4,401,050, Cl. 116-205.000.

Britt, Richard G.: *See—*
Britt, Laurence D.; and Britt, Richard G., 4,401,050, Cl. 116-205.000.

Broderson, Robert W.; Hurst, Paul J.; and Fellman, Ronald D., to University of California, The Regents of the. Apparatus for the linear predictive coding of human speech. 4,401,855, Cl. 179-15.55R.

Brooks & Perkins, Inc.: *See—*
Naffa, Faisal A., 4,401,286, Cl. 244-137.00R.

Brother Kogyo Kabushiki Kaisha: *See—*
Kurachi, Hisao; Ito, Takeo; and Onoda, Hiroshi, 4,401,395, Cl. 400-697.100.

Brown, Arling D., Jr., to Gould Inc. Electrostatic high voltage drive circuit using diodes. 4,401,999, Cl. 346-154.000.

Brown, Boveri and Cie AG: *See—*
Steinleitner, Gunther, 4,401,731, Cl. 429-104.000.

Brown, Frank R. Spring devices. 4,400,876, Cl. 30-186.000.

Brown, Galen K.: *See—*
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., 4,400,983, Cl. 74-25.000.

Brown, Gary M.; Bosco, Peter M.; and Danielson, Robert L., to Nabisco Brands, Inc. Cold water soluble gelatin and process. 4,401,685, Cl. 426-576.000.

Brown, Harold. Decorative roach trap. 4,400,905, Cl. 43-132.100.

Brown, Homer J., to West Company, The. Venting closure assembly. 4,401,226, Cl. 215-250.000.

Brown, LeeRoy W. Flue gas heat recovery apparatus. 4,401,261, Cl. 236-10.000.

Brown, Sam J., to Sam J. Brown Land and Cattle Company, Inc. Furrow follower vision correction system. 4,401,166, Cl. 172-430.000.

Brown, W. Sumner, to Exxon Reserach and Engineering Co. Free flight hammer for impact printer. 4,401,026, Cl. 101-93.330.

Brown, William M.: *See—*
Conroy, Betty A.; Brown, William M.; and Maio, Patrick S., 4,401,255, Cl. 229-37.00R.

Browning, Jesse. Method for converting a liquid paint spray booth to a powder paint spray booth. 4,401,445, Cl. 55-96.000.

Brunswick Corporation: *See—*
Staerzl, Richard E., 4,401,085, Cl. 123-488.000.

Brux, Robert A., to Seaco Industries. Vegetable banding apparatus. 4,401,020, Cl. 100-7.000.

Buan, Danilo P., to Pitney Bowes Inc. Disposable self contained ink cartridge for value printing device. 4,401,031, Cl. 101-363.000.

Buchin, Michael P.: *See—*
McKeighen, Ronald E.; and Buchin, Michael P., 4,401,957, Cl. 333-165.000.

Buchler, Ingrid, to Villeroy & Boch Keramische Werke KG. Letter card and confining means therefor. 4,401,258, Cl. 229-92.800.

Buchs, Wolfgang: *See—*
Bansemir, Horst; and Buchs, Wolfgang, 4,401,710, Cl. 428-229.000.

Buck, Rainer: *See—*
Wessel, Wolf; and Buck, Rainer, 4,401,081, Cl. 123-443.000.

Buckbee-Mears Company: *See—*
Walter, Leo; and Greul, Helmut W., 4,401,354, Cl. 339-19.000.

Buckwalter, Brian L.; and LaHann, Thomas R., to Procter & Gamble Company, The. Novel sulfonamide derivatives. 4,401,663, Cl. 424-321.000.

Buder, Wolfgang: *See—*
Karl, Alfons; and Buder, Wolfgang, 4,401,598, Cl. 260-349.000.

Buhler, Fritz: *See—*
Scheuchzer, Fredy; and Buhler, Fritz, 4,400,897, Cl. 37-104.000.

Bukoschek, Romuald L.: *See—*
Buzzi, Leo; and Bukoschek, Romuald L., 4,400,875, Cl. 30-43.920.

Burdette, George W.; and Schneider, Abraham I., to United States of America, Navy. Exo-tetrahydrotricyclopentadiene, a high density liquid fuel. 4,401,837, Cl. 585-253.000.

Burdette, Stephen D.: *See—*
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,401,132, Cl. 137-1.000.

Bureau de Recherches Geologiques et Minieres: *See—*
Bloise, Rene; Morizot, Georges; and Boissonnade, Genevieve, 4,401,644, Cl. 423-617.000.

Burger, Rainer: *See—*
Kobler, Ingo; and Burger, Rainer, 4,401,028, Cl. 101-178.000.

Burlington Industries, Inc.: *See—*
Conklin, Delano M.; Hansen, John H.; and Hodgin, John B., 4,401,782, Cl. 524-313.000.

Burnett, James H., to Cox, Herman E. Foreign object detector for protection of carding machines. 4,400,850, Cl. 19-0.230.

Buros, Michael C.: *See—*
Trosky, William J.; and Buros, Michael C., 4,401,192, Cl. 187-29.00R.

Burroughs Corporation: *See—*
Hazel, Robert L.; and LaBudde, Edward V., 4,402,061, Cl. 365-127.000.
Kadlecik, Jack; and Hill, Alvin M., 4,401,249, Cl. 225-97.000.

Young, William C., 4,401,691, Cl. 427-93.000.

Burrows, Aubrey L.; and Walter, Thomas J., to Edwin Cooper and Company Limited. Nitrogen-containing ashless dispersants and lubricating oil composition containing same. 4,401,581, Cl. 252-51.50A.

Burrows, Brian W.: *See*—
Szymborski, Joseph; Misra, Sudhansu S.; Eggers, Mark L.; and Burrows, Brian W., 4,401,730, Cl. 429-53.000.

Busack, Hans-Jurgen: *See*—
Schinkmann, Manfred; and Busack, Hans-Jurgen, 4,401,547, Cl. 204-415.000.

Buschow, Adolph G.; and Eidschun, Charles D., to Micro-Plate, Inc. Plating method and apparatus. 4,401,522, Cl. 204-15.000.

Busey, Gerald T. Quick-clamp gauge for monitoring pipe bending. 4,400,889, Cl. 33-372.000.

Bustin, Franz: *See*—
Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., 4,401,427, Cl. 493-199.000.

Butler, Jack B., to 4-S Oil Company, Inc. Stabilized seat. 4,401,290, Cl. 248-565.000.

Butwell, Kenneth F.: *See*—
Videira, Jose A.; Forte, Paulino; and Butwell, Kenneth F., 4,401,560, Cl. 208-324.000.

Buus, Ole; and Nielsen, Michael J., to Medi-Lab, Medicinsk Laboratorium A/S. Method and apparatus for measuring the intensity of preferably gamma radiation of radiation active deposit contained within a liquid sample. 4,401,889, Cl. 250-328.000.

Buzzi, Leo; and Bukoschek, Romuald L., to U.S. Philips Corporation. Dry-shaving apparatus. 4,400,875, Cl. 30-43.920.

C.A. Schroeder, Inc.: *See*—
Schroeder, Clifford A., 4,400,863, Cl. 29-450.000.

C.E. Equipment Co., Inc.: *See*—
Tatum, Joe F.; and Lewis, Thomas H., 4,401,540, Cl. 204-196.000.

C-I-L Inc.: *See*—
Seto, Kin; and Warren, Ian H., 4,401,544, Cl. 204-288.000.

C.K.S. S.n.c.: *See*—
Selvi, Fabio; and Chietti, Giovanni, 4,401,244, Cl. 223-37.000.

C. L. Frost & Son, Inc.: *See*—
Weis, Siegfried K.; and Frost, Charles C., 4,401,188, Cl. 184-15.00B.

C. R. Bard, Inc.: *See*—
Bare, Rex O., 4,401,356, Cl. 339-258.00R.

Caballero, Alejandro J.; and Holcombe, Ricardo I., to Materias Primas, Monterrey, S.A. Process for purifying silica sand. 4,401,638, Cl. 423-340.000.

Cabaussel, Louis, to Societe L. Ferraz. Brush-holder assemblies for electric motors, particularly for traction motors. 4,401,908, Cl. 310-229.000.

Cabeform Limited: *See*—
Morton, John; and Stevens, Keith D., 4,401,926, Cl. 318-376.000.

Cackley, George W.: *See*—
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,401,132, Cl. 137-1.000.

Cadars, Patrick, to Valeo. Device for tightly assembling a collector and a water box in heat exchanger. 4,401,157, Cl. 165-173.000.

Caffarelli, Elvio: *See*—
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, 4,401,573, Cl. 210-724.000.

Cahill, Dermot J. Security transfer arrangements. 4,401,037, Cl. 109-10.000.

Cain, George R., to Koppers Company, Inc. Apparatus for processing flushing liquor from coke ovens. 4,401,568, Cl. 210-515.000.

Caines, R. Scott. Nylon twine and the like having ameliorated knot strength. 4,401,327, Cl. 289-1.200.

Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, to International Flavors & Fragrances Inc. Enhancing or augmenting the aroma of detergents using 4-methyl-3-cyclohexene-1-carboxylic. 4,401,583, Cl. 252-174.110.

Caldicott, Jack R., to Mangood Corporation. System for weighing railroad cars in motion during loading. 4,401,175, Cl. 177-163.000.

Caldwell, Kenneth, to Fibrelock Fabrics Limited. Streamlining device for vehicles. 4,401,338, Cl. 296-1.00S.

Calgon Corporation: *See*—
Boffardi, Bennett P., 4,401,587, Cl. 252-389.00A.

Campbell, James S., to Spintex, Inc. Bearing assemblies for spindles. 4,401,349, Cl. 308-189.00R.

Campbell, Ronald J.: *See*—
Frank, Gunter; Kostlin, Heiner; Sprengers, Leo M.; and Campbell, Ronald J., 4,401,693, Cl. 427-160.000.

Campbell Soup Company: *See*—
Dahle, Leland K., 4,401,681, Cl. 426-94.000.

Canadian Patents & Development Limited: *See*—
Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, 4,401,920, Cl. 315-150.000.

Canavesi, Roberto; Ligorati, Ferdinando; Ghezzi, Roberto; and Clemente, Roberto, to Euteco Impianti S.p.A. Process for the recovery of molybdenum from mixtures of molybdenum compounds with other metallic compounds. 4,401,631, Cl. 423-54.000.

Candolin, Carl-Johan: *See*—
Olson, Torbjorn; Olauson, Lars G.; and Candolin, Carl-Johan, 4,401,510, Cl. 162-19.000.

Cannon, Frederick W., to Albany International Corp. Forming fabric seam and method of producing. 4,401,137, Cl. 139-383.00A.

Canon Denshi Kabushiki Kaisha: *See*—
Hirano, Hirofumi, 4,401,027, Cl. 101-106.000.

Canon Kabushiki Kaisha: *See*—
Hirano, Hirofumi, 4,401,027, Cl. 101-106.000.
Hirohata, Michio; and Ikari, Hideo, 4,401,378, Cl. 354-195.000.
Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.
Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, 4,402,056, Cl. 364-705.000.
Tamamura, Hideo; and Nagata, Toru, 4,401,379, Cl. 354-214.000.

Carasso, Marino G.; Cornelissen, Bernardus H. J.; and van Santen, Johannes G., to U.S. Philips Corporation. Circuit arrangement for discharging a capacity. 4,402,014, Cl. 358-217.000.

Carignan, Thomas N.: *See*—
Reynard, John M.; Carignan, Thomas N.; Paglia, Richard; and Rich, Joseph R., 4,401,858, Cl. 179-111.00R.

Carlsson, Lars, to Tetra Pak International AB. Method and an arrangement for the forward feeding of a material web in register with a crease line pattern. 4,401,250, Cl. 226-33.000.

Carlstedt, Anders; and Nilsson, Ake, to ASEA Aktiebolag. Strip or sheet mill with improved regulating device and method. 4,400,957, Cl. 72-8.000.

Carrier Corporation: *See*—
Gable, Gerald K.; and Dempsey, Daniel J., 4,401,425, Cl. 431-22.000.

Cartwright, David; and Collins, David, to Imperial Chemical Industries PLC. Herbicidal phenoxypyridines. 4,401,460, Cl. 71-94.000.

Caruso, Peter J., to Bendix Corporation, The. Cycle limiting means for an electromechanical decoder. 4,401,973, Cl. 340-345.000.

Case, Roger: *See*—
Boichot-Castagne, Bernard; Case, Roger; and Marin-Pache, Reynald, 4,401,872, Cl. 200-153.00G.

Casperson, John R., to Phillips Petroleum Company. Liquid seal lock hoppers and method of utilizing same. 4,401,402, Cl. 414-218.000.

Cassella Aktiengesellschaft: *See*—
Ferchland, Dieter; Kussmaul, Ulrich; Langer, Manfred; and Muller, Rolf, 4,401,603, Cl. 260-543.200.

Catalyst Research Corporation: *See*—
Schneider, Alan A.; Flower, Ronald J.; Bowser, George C.; and Kenyon, Lewis C., 4,401,847, Cl. 179-1.00H.

Caterpillar Tractor Co.: *See*—
Anders, Gene A.; Larson, Herbert J.; and Miller, Charles R., 4,401,154, Cl. 165-151.000.
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,401,132, Cl. 137-1.000.

Cauthen, Mark E.: *See*—
Russo, Joseph; Sonder, Richard; Miller, Robert E.; and Cauthen, Mark E., 4,401,036, Cl. 108-146.000.

Ceprini, Mario Q.; Goodman, Donald; and Hoch, Samuel, to Tenneco Polymers, Inc. Process for the production of vinyl halide polymers that uses an alkyl-substituted trisphenol as the chain-terminating agent. 4,401,798, Cl. 526-84.000.

Ceramiche di Riosecco dei Figli de Dante Baldelli & C. S.n.c.: *See*—
Baldelli, Massimo, 4,401,228, Cl. 220-235.000.

Chamberlin, James W.: *See*—
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Champion International Corp.: *See*—
Benham, Albert A., 4,401,257, Cl. 229-72.000.

Champion Spark Plug Company: *See*—
Moser, Richard A.; Schaffer, J. Thomas; and Weinstein, Richard, 4,402,030, Cl. 361-93.000.

Champlin, Walter B. Surface layout gauge. 4,400,883, Cl. 33-169.00R.

Charles, Barry G.: *See*—
Adams, Francis J.; Child, Robert P.; and Charles, Barry G., 4,401,016, Cl. 99-323.100.
Child, Robert P.; and Charles, Barry G., 4,401,607, Cl. 261-121.00R.

Charles, Larry L.: *See*—
Lloyd, Raymond A.; Charles, Larry L.; Susie, William F.; Tate, Allen W., Jr.; and Reeder, James R., 4,402,055, Cl. 364-579.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
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Consales, Emanuel J., 4,400,885, Cl. 33-185.00R.

Charrier, Elie; and Fourno, Rene, to Paquet Thermique, S.A. Gas boiler able to operate in a sealed combustion circuit. 4,401,058, Cl. 122-17.000.

Chase, Gregory J., to Chase Precast Corp. Digester. 4,401,441, Cl. 48-111.000.

Chase Precast Corp.: *See*—
Chase, Gregory J., 4,401,441, Cl. 48-111.000.

Chedid, Louis: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, 4,401,659, Cl. 424-177.000.

Chemical Waste Management Ltd.: *See*—
Evans, Gordon, 4,400,936, Cl. 60-274.000.

Chen, Nai-Yung: *See*—
Kelley, Robert B.; Birk, John R.; and Chen, Nai-Yung, 4,402,053, Cl. 364-513.000.

Chen, Tsang J., to Eastman Kodak Company. Latex compositions for water resistant coating applications. 4,401,787, Cl. 524-603.000.

Chern, Mao-Jin; and Lowrey, Robert D., to Minnesota Mining and Manufacturing Company. Liquid crystal display and photopolymerizable sealant therefor. 4,401,537, Cl. 204-159.110.

Cherrington, Martin D., to Reading & Bates Construction Co. Apparatus for drilling underground arcuate paths and installing production casings, conduits, or flow pipes therein. 4,401,170, Cl. 175-73.000.

Cherry, Kenneth A. Combination food freezer/dining table. 4,400,951, Cl. 62-258.000.

Chevron Research Company: *See—*
Anderson, Glenn W.; and Hutchison, Stanley O., 4,401,160, Cl. 166-88.000.
Frost, Kenneth, 4,401,580, Cl. 252-25.000.
Miller, Stephen J., 4,401,555, Cl. 208-111.000.
Mitchell, David S., 4,401,551, Cl. 208-11.0LE.

Chiang, Albert C., to Pitney Bowes Inc. Preparation of positive toners by acid treatment. 4,401,742, Cl. 430-137.000.

Chiang, Peter T.; and Tiepel, Erich W., to Westinghouse Electric Corp. Process for making high quality nuclear fuel grade ammonium diuranate from uranyl fluoride solutions. 4,401,628, Cl. 423-15.000.

Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., to National Starch And Chemical Corporation. Polymeric adducts with pendant polymerizable double bonds, their preparation and use as reactive thickeners in improved anaerobic compositions. 4,401,793, Cl. 525-285.000.

Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, to Tanabe Seiyaku Co., Ltd. Process for racemizing optically active α-amino acids or a salt thereof. 4,401,820, Cl. 548-344.000.

Chietti, Giovanni: *See—*
Selvi, Fabio; and Chietti, Giovanni, 4,401,244, Cl. 223-37.000.

Chihara, Takeshi; and Gokimoto, Hiroyuki, to Delta Kogyo Co. Ltd.; and Toyo Kogyo Co., Ltd. Automobile seat back reclining mechanism. 4,401,344, Cl. 297-367.000.

Child, Robert P.; and Charles, Barry G., to Thorn Cascade Company Limited. Aerated drinks machine. 4,401,607, Cl. 261-121.00R.

Child, Robert P.: *See—*
Adams, Francis J.; Child, Robert P.; and Charles, Barry G., 4,401,016, Cl. 99-323.100.

Children's Hospital Medical Center: *See—*
Clark, Leland C., Jr., 4,401,122, Cl. 128-635.000.

Chitre, Sanjeev R., to Photowatt International, Inc. Semicrystalline solar cell. 4,401,840, Cl. 136-258.000.

Choay, Jean: *See—*
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Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, 4,401,662, Cl. 424-183.000.
Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, 4,401,758, Cl. 435-84.000.

Choay, S.A.: *See—*
Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, 4,401,662, Cl. 424-183.000.
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Choi, Byung C.; and Graziani, Kenneth R., to Mobil Oil Corporation. Split stream reforming. 4,401,554, Cl. 208-64.000.

Chore-Time Equipment, Inc.: *See—*
Van Gilst, Carl W., 4,401,057, Cl. 119-51.00R.

Christensen, Robert B.; and Kramer, Lee F., to Dresser Industries, Inc. Bucket pivot assembly. 4,400,898, Cl. 37-118.00A.

Chrysler Corporation: *See—*
Krantz, Emerson H.; and Peebles, Russell H. 4,402,013, Cl. 49-352.000.

Chu, Pochen; and Dwyer, Francis G., to Mobil Oil Corporation. Selective zeolite sorption of group V-B element hydrides and derivatives thereof. 4,401,572, Cl. 210-681.000.

Ciba-Geigy Corporation: *See—*
Breitenfellner, Franz, 4,401,784, Cl. 524-424.000.
Gruenfeld, Norbert, 4,401,818, Cl. 546-165.000.
Hertel, Helfried, 4,401,503, Cl. 156-461.000.
Meyer, Willy, 4,401,458, Cl. 71-91.000.
Munk, Kurt, 4,401,776, Cl. 523-443.000.
Portmann, Robert, 4,401,600, Cl. 260-465.00E.

Cie Miniere de l'Ogooue (COMILOG): *See—*
Gaudet, Henri, 4,401,034, Cl. 104-178.000.

City of Hope Research Institute: *See—*
Itakura, Keiichi, 4,401,796, Cl. 525-340.000.

Claringbull, Peter, to Conzinc Riotinto Malaysia Sendirian Berhard. Impact applying mechanism. 4,401,168, Cl. 173-135.000.

Clarion Co., Ltd.: *See—*
Takagi, Satoshi; and Watanabe, Toshio, 4,402,019, Cl. 360-71.000.
Yokota, Tadashi; and Watanabe, Wataru, 4,402,020, Cl. 360-72.100.
Yokota, Tadashi; and Watanabe, Wataru, 4,402,026, Cl. 360-105.000.

Clark Equipment Company: *See—*
Bartow, Richard J., 4,401,191, Cl. 187-9.00E.

Clark, James M., to International Telephone and Telegraph Corporation. Plural storage areas with different priorities in a processor system separated by processor controlled logic. 4,402,041, Cl. 364-200.000.

Clark, Leebert D.: *See—*
Dickinson, Jane H.; and Clark, Leebert D., 4,401,246, Cl. 224-150.000.

Clark, Leland C., Jr., to Children's Hospital Medical Center. Cutaneous methods of measuring body substances. 4,401,122, Cl. 128-635.000.

Clauer, Allan H.; Fairand, Barry P.; Ford, Stephen C.; and Walters, Craig T., to Battelle Development Corporation. Laser shock processing. 4,401,477, Cl. 148-4.000.

Claussen, Nils; and Petzow, Gunter. High-strength ceramic laminated tube and the production and use thereof. 4,401,729, Cl. 428-623.000.

Clemente, Roberto: *See—*
Canavesi, Roberto; Ligorati, Ferdinando; Ghezzi, Roberto; and Clemente, Roberto, 4,401,631, Cl. 423-54.000.

Clere, Thomas M., to Diamond Shamrock Corporation. Electrode. 4,401,530, Cl. 204-98.000.

Cocco, Vincent L., to Polaroid Corporation. Processing apparatus for self-processing film unit with a folded applicator. 4,401,381, Cl. 354-303.000.

Cody, Joe C.; and Rettke, Curt, to Ralston Purina Company. Feeding device for caged animals. 4,401,056, Cl. 119-18.000.

Coffee, Ronald A., to Imperial Chemical Industries PLC. Containers for use in electrostatic spraying. 4,401,274, Cl. 239-690.000.

Cohen, Irun R.: *See—*
Lwoff, Andre; Yerushalmi, Aharon; Cohen, Irun R.; and Moshe, Gideon B., 4,401,114, Cl. 128-200.140.

Cohnen, Erich, to Beiersdorf Aktiengesellschaft. Substituted 3-aryl-2-cycloalkeu-1-one and method of preparation thereof. 4,401,831, Cl. 564-221.000.

Colbert, Aaron: *See—*
Tajkowski, Edward G.; and Colbert, Aaron, 4,401,584, Cl. 252-194.000.

Colgate-Palmolive Company: *See—*
Piechota, Stanley E., Jr., 4,401,648, Cl. 424-49.000.

Collier, David W., to W.B. Combustion, Inc. Single-ended recuperative radiant tube assembly and method. 4,401,099, Cl. 126-91.00A.

Collins, David: *See—*
Cartwright, David; and Collins, David, 4,401,460, Cl. 71-94.000.

Compagnie Industrielle des Telcommunications Cit-Alcatel: *See—*
Cupuis, Bernard; and Thiaud, Jacques, 4,402,074, Cl. 370-14.000.

Compagnie Industrielle Radioelectrique: *See—*
Muller, Christian, 4,402,016, Cl. 358-280.000.

Cone-Blanchard Machine Company: *See—*
Wilterdink, Bernard W., 4,402,032, Cl. 361-145.000.

Conger, Ronald R., to General Electric Company. Arrangement for temperature stabilization of a limiter. 4,401,905, Cl. 307-546.000.

Congoleum Corporation: *See—*
Mansolillo, Robert D.; and Kaminski, Stanley J., 4,401,611, Cl. 264-46.400.

Conklin, Delano M.; Hansen, John H.; and Hodgin, John B., to Burlington Industries, Inc. Hot melt size and yarns sized therewith. 4,401,782, Cl. 524-313.000.

Connick, William J., Jr., to United States of America, Agriculture. Controlled release of bioactive materials using alginate gel beads. 4,401,456, Cl. 71-88.000.

Connolly, John E.; and Huggett, Mark D., to Gator Manufacturing, Inc. Portable marking tool. 4,401,030, Cl. 101-316.000.

Conroy, Betty A.; Brown, William M.; and Maio, Patrick S., to Federal Paper Board Co., Inc. Distributor pack carton. 4,401,255, Cl. 229-37.00R.

Consales, Emanuel J., to Charles Stark Draper Laboratory, Inc., The. Locking system for a remote center compliance device. 4,400,885, Cl. 33-185.00R.

Constable, Michael J.; and Hamblin, David S., to DRG (UK) Limited. Integrally formed injection moulded plastics container. 4,401,232, Cl. 220-450.000.

Container Corporation of America: *See—*
Bell, Richard L.; and Helms, Charles R., 4,401,229, Cl. 220-259.000.
Helms, Charles R., 4,401,231, Cl. 220-359.000.
Helms, Charles R., 4,401,248, Cl. 225-47.000.

Contracap, Inc.: *See—*
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,401,534, Cl. 264-138.000.

Contraves AG: *See—*
Arndt, Klaus, 4,401,193, Cl. 188-69.000.

Control Concepts, Inc.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,401,009, Cl. 91-28.000.

Conzinc Riotinto Malaysia Sendirian Berhard: *See—*
Claringbull, Peter, 4,401,168, Cl. 173-135.000.

Cook, Ronald A.; and Strutt, Derek W., to Ford Motor Company. Steering column assembly. 4,400,990, Cl. 74-492.000.

Cooke, Anson R.: *See—*
Fritz, Charles D.; Evans, Wilbur E.; and Cooke, Anson R., 4,401,454, Cl. 71-76.000.

Cooper Industries, Inc.: *See—*
O'Rourke, Harold T., 4,401,253, Cl. 228-125.000.

Cooper, Lawrence E.: *See—*
Trenkler, George; and Cooper, Lawrence E., 4,401,986, Cl. 340-870.320.

Cooper, Martin. Working gemstones. 4,401,876, Cl. 219-121.0LJ.

COPI, Inc.: *See—*
Hillberg, Robert L., 4,400,901, Cl. 42-70.00F.

Cope, Michael E., to Foster Wheeler Energy Corporation. Automatic line termination in distributed industrial process control system. 4,402,082, Cl. 371-22.000.

Cordier, Georges; and Leroux, Patrick, to Rhone-Poulenc Specialites Chimiques. Process for the preparation of pyridine and substituted pyridines. 4,401,819, Cl. 546-252.000.

Corna, John F.; and Blais, Marcel H., to Statewide Pools, Inc. Swimming pool walls with gutter and conduit construction. 4,400,834, Cl. 4-506.000.

Cornelissen, Bernardus H. J.: *See—*
Carasso, Marino G.; Cornelissen, Bernardus H. J.; and van Santen, Johannes G., 4,402,014, Cl. 358-217.000.

Corning Glass Works: *See—*
Brezinski, Donald P., 4,401,548, Cl. 204-435.000.

Costello, Norman F.; and Granetzke, Dennis C., to Modine Manufacturing Company. Temperature controlled fuel heater. 4,401,091, Cl. 123-557.000.

Cox, George W.; and Rattner, Justin R., to Intel Corporation. Interprocessor communication system. 4,402,046, Cl. 364-200.000.

Cox, Herman E.: *See—*
Burnett, James H., 4,400,850, Cl. 19-0.230.
Cox, Percy T., to Texaco Inc. Small hole well logging sonde and system with transmitter and receiver assemblies. 4,401,947, Cl. 324-338.000.
Coxon, John: *See—*
Lloyd, Harold; and Coxon, John, 4,401,871, Cl. 200-150.00A.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-substituted-5-benzoyl benzofuran-2-carboxylic acids and their use in treating hypertension. 4,401,669, Cl. 424-248.540.
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A., to Du Pont de Nemours, E. I., and Company. Covalently bonded high refractive index particle reagents and their use in light scattering immunoassays. 4,401,765, Cl. 436-533.000.
Craver, Edward H.; and Pinnolis, Samuel, to Western Electric Company. Wiring connector plugs to produce a wire mult. 4,400,874, Cl. 29-861.000.
Crombie, Edwin A., III, to Westinghouse Electric Corp. Method of selective grain growth in nickel-base superalloys by controlled boron diffusion. 4,401,480, Cl. 148-11.50N.
Cronin, Michael J., to Lockheed Corporation. Variable-speed drive for control of induction generators. 4,401,938, Cl. 322-29.000.
Crowson, James A., to Robertshaw Controls Company. Pneumatic relay controlled transducer construction. 4,401,263, Cl. 236-84.000.
Cruz, Exequiel D., to Respiratory Care, Inc. Nebulizer bottle. 4,401,241, Cl. 222-527.000.
Crymes Enterprises, Inc.: *See—*
Zills, Robert V., 4,401,245, Cl. 224-148.000.
Csaszar, Gabor; Goldman, Fred M.; Oehley, Gernot; and Svoboda, Edward J., to Midas International Corporation, a part interest. Ultrasonic transducer. 4,401,089, Cl. 123-536.000.
Cunningham, William E.; and Simpson, Orvin D., to Cunningham, William E. Flange and casing checking instrument. 4,401,941, Cl. 324-54.000.
Cupuis, Bernard; and Thiaud, Jacques, to Compagnie Industrielle des Telcommunications Cit-Alcatel. Switching network test system. 4,402,074, Cl. 370-14.000.
Curtin, William J.; Henning, Paul N.; and Post, Kendall E., to Amtel Communications, Inc. Control system for handling direct inward dialed telephone calls. 4,401,856, Cl. 179-27.0FH.
Curwick, Leroy R.: *See—*
Benn, Raymond C.; Mihalisin, John R.; Curwick, Leroy R.; and Merrick, Howard F., 4,401,622, Cl. 420-449.000.
Cushman, David W.: *See—*
Greenberg, Roland; Cushman, David W.; Vogt, B. Richard; Weisenborn, Frank L.; and Antonaccio, Michael J., 4,401,677, Cl. 424-317.000.
Custom Microdesign Limited: *See—*
Witts, Alan G.; and St. Clair Wilshire, Philip, 4,401,994, Cl. 346-83.000.
Cyr, Reginald J., to Sonatech, Inc. Ranging system having reduced recognition jitter. 4,401,987, Cl. 343-5.0CF.
Dahle, Leland K., to Campbell Soup Company. Two-phase food products with reduced inter-phase moisture transfer. 4,401,681, Cl. 426-94.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Hida, Yoshiaki, 4,401,721, Cl. 428-484.000.
Daichiku Co., Ltd.: *See—*
Oide, Kunimasa, 4,401,442, Cl. 51-297.000.
Daidotokushuko Kabushikikaisha: *See—*
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,401,484, Cl. 148-131.000.
Daigaku, Masaaki, to Olympus Optical Co. Ltd. Device for preventing erroneous insertion of a plurality of print substrates into corresponding connectors in a rack. 4,401,358, Cl. 339-113.00L.
Daiichi Electric Co., Ltd.: *See—*
Sato, Hiroshi, 4,401,995, Cl. 346-110.00R.
Dailey, Patrick E., to Smith International, Inc. Pilot valve initiated mud pulse telemetry system. 4,401,134, Cl. 137-624.110.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Yamada, Mitsuhiko, 4,402,007, Cl. 358-75.000.
Yamada, Mitsuhiko, 4,402,015, Cl. 358-280.000.
Dana Corporation: *See—*
Kaminski, David C.; and Graumlich, William H., 4,401,866, Cl. 200-61.880.
Daniels, Richard H.: *See—*
Enright, John A.; Ives, Milton N.; and Daniels, Richard H., 4,401,959, Cl. 335-272.000.
Danielson, Robert L.: *See—*
Brown, Gary M.; Bosco, Peter M.; and Danielson, Robert L., 4,401,685, Cl. 426-576.000.
Darrow, John O. G., to American Standard Inc. Vital lowest speed command selector. 4,401,970, Cl. 340-47.000.
Data General Corporation: *See—*
Thompson, Corey M., 4,401,288, Cl. 248-476.000.
Davidson, Jeffrey: *See—*
Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, 4,401,666, Cl. 424-245.000.
Davis, Darrell E., to Motorola, Inc. Low-voltage, complementary symmetry class B amplifier arrangement. 4,401,950, Cl. 330-255.000.
Davis, Donald C.; McConnell, Richard L.; and Meyer, Max F., Jr., to Eastman Kodak Company. Poly(vinyl chloride) plastisol compositions. 4,401,720, Cl. 428-483.000.
Davis, Michael D., to Eaton Corporation. Hydraulic pump and improved flow control valve assembly for use therein. 4,401,417, Cl. 417-300.000.
Davis, Ralph A.; and Stauffer, Randy C., to Dow Chemical Co., The. Oxidizing medium for dyes. 4,401,435, Cl. 8-627.000.
Davy, John C.; Fenton, Brian P.; and Ramage, John G., to International Business Machines Corporation. Motor control system for a single phase induction motor. 4,401,933, Cl. 318-778.000.
DBS, Inc.: *See—*
Barbour, William P., 4,401,029, Cl. 101-269.000.
DCI Marketing: *See—*
Rex, Roger F., 4,401,323, Cl. 281-45.000.
Dean, Joe O. Rotary piston engine. 4,401,062, Cl. 123-44.00E.
deBruyn, Robert J.: *See—*
Green, Gordon J.; and deBruyn, Robert J., 4,401,969, Cl. 340-41.00R.
Debus, Gerhard: *See—*
Kleiner, Hans-Jerg; Knittel, Volker; and Debus, Gerhard, 4,401,473, Cl. 106-109.000.
Dechavanne, Jacques. Seal, scraper, and guide for piston rod of single-action cylinder. 4,401,307, Cl. 277-50.000.
Deere & Company: *See—*
Johnson, Stanley J.; Allen, David T.; and Baker, Keith R., 4,401,403, Cl. 414-335.000.
Lobmeyer, Raymond J.; and Miller, James A., 4,400,937, Cl. 60-422.000.
Degussa Aktiengesellschaft: *See—*
Karl, Alfons; and Buder, Wolfgang, 4,401,598, Cl. 260-349.000.
Vogel, Karl, 4,401,140, Cl. 141-68.000.
Dehuysser, Andre, to Intec Corporation. Method and apparatus for optically inspecting a moving web of glass. 4,401,893, Cl. 250-572.000.
DeJong, Peter G., to General International Corporation. Vibratory massage device. 4,401,109, Cl. 128-41.000.
Dell, Travis E. Shrimp peeling unit. 4,400,849, Cl. 17-72.000.
Delmed, Inc.: *See—*
Lundell, Edwin O.; and Kwiatkowski, George T., 4,401,536, Cl. 204-159.200.
Delta Kogyo Co. Ltd.: *See—*
Chihara, Takeshi; and Gokimoto, Hiroyuki, 4,401,344, Cl. 297-367.000.
Demny, Florian C.: *See—*
Stewart, Thomas L.; and Demny, Florian C., 4,401,575, Cl. 210-746.000.
Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,401,601, Cl. 260-464.000.
Dempsey, Daniel J.: *See—*
Gable, Gerald K.; and Dempsey, Daniel J., 4,401,425, Cl. 431-22.000.
de Polo, Harry R. Apparatus for making helically wound tubular articles. 4,401,041, Cl. 112-63.000.
De Prijcker, Jozef P.: *See—*
Vaes, Jos A.; and De Prijcker, Jozef P., 4,401,753, Cl. 430-502.000.
DeSantis, Raymond P., to PTX-Pentronix, Inc. Anvil assembly for a powder-compacting anvil press. 4,401,614, Cl. 264-109.000.
Deutschmann, Herbert; and Ruetz, Georg, to MTU Motoren-Und Turbinen-Union Friechichshafen GmbH. Supercharged reciprocating internal combustion engine. 4,400,945, Cl. 60-612.000.
DeVita, Achilles P.; and Watkins, Manley C., to General Steel Industries, Inc. Synchronously counter-rotating intermeshing differential speed crusher roll assembly. 4,401,279, Cl. 241-236.000.
DeVitt, Herbert W., Jr.: *See—*
Eddington, George D.; and DeVitt, Herbert W., Jr., 4,401,010, Cl. 91-273.000.
DeVries, Donald H.: *See—*
Harper, William P.; and DeVries, Donald H., 4,401,843, Cl. 174-72.00B.
de Witt, Paolo, to Sigma-Tau. Novel acyl-derivatives of carnitine and process for their preparation. 4,401,827, Cl. 560-1.000.
De Zen, Vittorio. Vacuum sizing device. 4,401,424, Cl. 425-388.000.
Diamond Shamrock Corporation: *See—*
Clere, Thomas M., 4,401,530, Cl. 204-98.000.
Diaz, Zaida: *See—*
Blytas, George C.; and Diaz, Zaida, 4,401,642, Cl. 423-573.00G.
Dibos, Otmar: *See—*
Baermann, Horst; and Dibos, Otmar, 4,401,961, Cl. 335-285.000.
Dickens, Willie G. Air compressor switch device. 4,401,413, Cl. 417-26.000.
Dickey-john Corporation: *See—*
Gorsek, Edmund J., 4,401,909, Cl. 310-323.000.
Dickinson, Jane H.; and Clark, Leebert D., to Torel, Inc. Adjustable carrying strap. 4,401,246, Cl. 224-150.000.
Diederich, Gerd; Solmecke, Rolf; Husselmann, Hans; Heimann, Eberhard; and Schauffele, Frithjof, to Mannesmann Aktiengesellschaft. Charging a mold for continuous casting. 4,401,243, Cl. 222-591.000.
Diesel Kiki Co., Ltd.: *See—*
Ishizuka, Yutaka, 4,401,414, Cl. 417-269.000.
Dietz, Dennis R.: *See—*
Guess, Joe F.; Dietz, Dennis R.; and Hottinger, Charles F., 4,401,124, Cl. 128-660.000.
Dietz, Raymond L.; Featherby, Michael; and Margetts, Peter K., to Johnson Matthey Inc. Silver-filled glass. 4,401,767, Cl. 501-19.000.
Di Motta, Benito. Duplex lock. 4,400,955, Cl. 70-339.000.
Disselkoen, Mel. Queen bee mating nucleus. 4,400,837, Cl. 6-1.000.

Distler, Walter; and Heinzelmann, Karl-Georg, to Siemens Aktiengesellschaft. Tomographic x-ray apparatus for the production of transverse layer images. 4,402,085, Cl. 378-15.000.

Dittmar, Wilfried: *See—*
Franz, Reinhard; and Dittmar, Wilfried, 4,401,005, Cl. 84-1.010.

Dobersch, Gerhard. Side protection device for scaffoldings. 4,401,186, Cl. 182-113.000.

Dobi, Tibor J., to Volcano Corporation. Thermal torch. 4,401,040, Cl. 110-349.000.

Dobrzanski, John J., to General Signal Corporation. Electrical controls for ionization smoke detector. 4,401,979, Cl. 340-629.000.

Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther, 4,400,880, Cl. 33-125.00C.

Doi, Yoshihiko; Hirayama, Toshikazu; Miyawaki, Yasushi; and Maruyama, Masao, to Sumitomo Electric Industries, Ltd. Sintering furnace for powder metallurgy. 4,401,297, Cl. 266-252.000.

Doi, Yoshihiko: *See—*
Kobayashi, Mitsunori; and Doi, Yoshihiko, 4,401,719, Cl. 428-457.000.

Dolezal, Henry: *See—*
Madsen, Brent W.; Dolezal, Henry; Bloom, Philip A.; and Shirts, Monte B., 4,401,632, Cl. 423-87.000.

Dolland, Carlisle R.; and Bailey, David A., to United States of America, National Aeronautics and Space Administration. Adaptive control system for line-commutated inverters. 4,401,934, Cl. 318-798.000.

Donaldson, Jack J.: *See—*
Benoit, Gordon L.; Bustin, Franz; and Donaldson, Jack J., 4,401,427, Cl. 493-199.000.

Donat Flamand Inc.: *See—*
Giguere, Jean P., 4,400,923, Cl. 52-455.000.

Donley, Harold E., to PPG Industries, Inc. Pyrolytic coating reactant for defect and durability control. 4,401,474, Cl. 106-243.000.

Donovan, Joseph F.: *See—*
Spencer, Jack D.; and Donovan, Joseph F., 4,401,158, Cl. 166-51.000.

Dorson, William J., Jr.; and Pizziconi, Vincent B., to Biomedical Labs. Method of and apparatus for detoxifying mammalian hosts. 4,401,430, Cl. 604-4.000.

Douglas & Lomason Company: *See—*
Nemechek, Marshall E., 4,401,174, Cl. 177-114.000.

Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V.: *See—*
Thomassen, Johan H. C., 4,401,239, Cl. 222-183.000.

Dow Chemical Co., The: *See—*
Davis, Ralph A.; and Stauffer, Randy C., 4,401,435, Cl. 8-627.000.
Oriel, Sharon L.; and Flowers, Jimmy D., 4,401,794, Cl. 525-328.200.

Dow Corning Corporation: *See—*
Hamada, Mitsuo; and Yasuda, Sadami, 4,401,500, Cl. 156-307.500.

Dowrick, John S., to Beecham Group Limited. Intramammary compositions. 4,401,674, Cl. 424-271.000.

Dragerwerk Aktiengesellschaft: *See—*
Schinkmann, Manfred; and Busack, Hans-Jurgen, 4,401,547, Cl. 204-415.000.

Drechsel, Ludwig; and Lasch, Margarete, to Jenoptik Jena GmbH. Projecting screen for optical purposes. 4,401,368, Cl. 350-126.000.

Dresser Industries Inc.: *See—*
Angehrn, Jorg A., 4,402,068, Cl. 367-26.000.
Christensen, Robert B.; and Kramer, Lee F., 4,400,898, Cl. 37-118.00A.
Fuchs, Benjamin H., 4,401,171, Cl. 175-267.000.

Drew Chemical Corporation: *See—*
Farrington, Thomas A.; and Nowakowski, Tamara, 4,401,574, Cl. 210-728.000.

Dreyfus, Gerard: *See—*
Lewiner, Jacques; Dreyfus, Gerard; and Perino, Didier, 4,401,891, Cl. 250-374.000.

DRG (UK) Limited: *See—*
Constable, Michael J.; and Hamblin, David S., 4,401,232, Cl. 220-450.000.

Driessen, Manfred; Keller, Walter; and Kutz, Johannes, to Eduard Kusters. Apparatus for the continuous treatment of textile and similar webs of material. 4,400,953, Cl. 68-202.000.

Droira, Diego I.; and Sikorski, Richard J., to Universal Research Laboratories, Incorporated. Apparatus for applying integrated circuits to a circuit board. 4,401,234, Cl. 221-92.000.

Duenke, Clarence G., to Warco, Inc. Resistor insertion fuse. 4,401,963, Cl. 337-282.000.

Duffy, John J.: *See—*
Gitlin, Harvey S.; and Duffy, John J., 4,401,202, Cl. 194-55.000.

DuLoft, Walter A., to Miller, Taylor C., Jr. Fuel-air mixing device. 4,401,095, Cl. 123-590.000.

Dunkel, Gerd: *See—*
Becker, Kunibert; Elsner, Burckhard; and Dunkel, Gerd, 4,401,399, Cl. 405-299.000.

Dunlop Limited: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A., 4,401,765, Cl. 436-533.000.
Levitt, George, 4,401,816, Cl. 544-320.000.
Matthews, Douglas A., 4,401,336, Cl. 294-94.000.
Parker, John W.; and Auer, John H., Jr., 4,402,034, Cl. 361-208.000.
Silva, Raimund H.; and Smith, Roger A., 4,401,711, Cl. 428-252.000.
Turner, John J. P., 4,401,588, Cl. 252-421.000.

Duracell Inc.: *See—*
Hamilton, Noble E., 4,401,732, Cl. 429-105.000.

Duracell International Inc.: *See—*
Moses, Peter R.; Taylor, Alwyn H.; and Turchan, Michael J., 4,401,735, Cl. 429-195.000.

Durand, David, to Iannetta, Raymond, a part interest. Printed circuit and method of forming same. 4,401,686, Cl. 427-13.000.

Dursch, Walter: *See—*
Eckardt, Peter; and Dursch, Walter, 4,401,471, Cl. 106-87.000.

Dutruc-Rosset, Gilles: *See—*
Bouchaudon, Jean; Dutruc-Rosset, Gilles; Farge, Daniel; and James, Claude, 4,401,658, Cl. 424-177.000.

Duva, Robert; and Mayer, Linda J., to Occidental Chemical Corporation. Process for the electrodeposition of palladium. 4,401,527, Cl. 204-47.000.

Dvorachek, Harold A.; and Klimek, Boleslaw M., to Echlin Inc. Electrical connectors having insert spring, cable clip and contacts with pressure strips. 4,401,357, Cl. 339-272.00R.

Dwyer, Francis G.: *See—*
Chu, Pochen; and Dwyer, Francis G., 4,401,572, Cl. 210-681.000.

Dynapol Shareholders Liquidating Trust: *See—*
Matzinger, David P., 4,401,516, Cl. 203-33.000.

E. R. Squibb & Sons, Inc.: *See—*
Greenberg, Roland; Cushman, David W.; Vogt, B. Richard; Weisenborn, Frank L.; and Antonaccio, Michael J., 4,401,677, Cl. 424-317.000.

Ealet, Pierre M., to Societe Anonyme d'Attelages Lemoine. Handling device for facilitating the changing of vehicle wheels, notably of agricultural tractors and trucks. 4,401,405, Cl. 414-428.000.

Eames, Richard C.: *See—*
Roseman, Michael P.; Eames, Richard C.; and Barrett, Marlin W., 4,401,204, Cl. 198-431.000.

Earl, Robert W., to Garrett Corporation, The. Throttle linkage control. 4,401,077, Cl. 123-376.000.

Earnest, Steven E., to Mobay Chemical Corporation. Process for scavenging sulfur monochloride from the reaction mixture from the chlorination of dialkyldithiophosphoric acid to dialkylthiophosphoric acid chloride. 4,401,605, Cl. 260-990.000.

Eastman Kodak Company: *See—*
Chen, Tsang J., 4,401,787, Cl. 524-603.000.
Davis, Donald C.; McConnell, Richard L.; and Meyer, Max F., Jr., 4,401,720, Cl. 428-483.000.
Lau, Philip T. S., 4,401,752, Cl. 430-385.000.
Weemes, Doyle A.; Seymour, Robert W.; and Wicker, Thomas H., 4,401,805, Cl. 528-302.000.
Wooten, Willis C.; and Zannucci, Joseph S., 4,401,804, Cl. 528-272.000.

Eaton Corporation: *See—*
Davis, Michael D., 4,401,417, Cl. 417-300.000.
Frelk, Elmer S., 4,401,359, Cl. 339-253.00R.
Kotian, Vijayraj M., 4,401,783, Cl. 524-371.000.
Wojtecki, Rudolph G.; and Kaan, Joseph P., 4,401,156, Cl. 165-172.000.

Eaton, Gerald E.; and Shtarkman, Emile M., to Imperial Clevite Inc. Flexible column viscous spring damper. 4,401,298, Cl. 267-140.100.

Echlin Inc.: *See—*
Dvorachek, Harold A.; and Klimek, Boleslaw M., 4,401,357, Cl. 339-272.00R.

Eckardt, Peter; and Dursch, Walter, to Hoechst Aktiengesellschaft. Inorganic cellular material and process for the manufacture thereof. 4,401,471, Cl. 106-87.000.

Eckold, Gerd-Jurgen; and MaaB, Hans, to Walter Eckold GmbH & Co. Tool for forming a lateral opening in a tube. 4,400,966, Cl. 72-392.000.

Eddington, George D.; and DeVitt, Herbert W., Jr. Variable-torque-accommodating machine. 4,401,010, Cl. 91-273.000.

Edelmann, Martin, to Kernforschungszentrum Karlsruhe GmbH. Method and circuit arrangement for determining the individual coolant flow rate of the fuel elements of a nuclear reactor. 4,401,620, Cl. 376-247.000.

Eduard Kusters: *See—*
Driessen, Manfred; Keller, Walter; and Kutz, Johannes, 4,400,953, Cl. 68-202.000.

Edwin Cooper and Company Limited: *See—*
Burrows, Aubrey L.; and Walter, Thomas J., 4,401,581, Cl. 252-51.50A.

Eggers, Mark L.: *See—*
Szymborski, Joseph; Misra, Sudhansu S.; Eggers, Mark L.; and Burrows, Brian W., 4,401,730, Cl. 429-53.000.

Ehrlich, Johann. Sole construction for shoes. 4,400,894, Cl. 36-33.000.

Ehrmann, Karl: *See—*
Brand, Gunter; Gerber, Richard; Ehrmann, Karl; Kaufmann, Reinhold; and Kalippke, Harald, 4,401,066, Cl. 123-146.50A.

Eidschun, Charles D.: *See—*
Buschow, Adolph G.; and Eidschun, Charles D., 4,401,522, Cl. 204-15.000.

Eikonix Corporation: *See—*
Finley, Jack D.; and Whitney, Robert E., 4,401,887, Cl. 250-216.000.

Eiler, Donald C., to United Technologies Corporation. Lobe mixer for gas turbine engine. 4,401,269, Cl. 239-265.170.

Eisenberg, Arnold J., to Owens-Corning Fiberglas Corporation. Method of and apparatus for controlling the breakage of glass fibers. 4,401,452, Cl. 65-2.000.

Eisenmann, Erhard T.: *See—*
Augis, Jacques A.; and Eisenmann, Erhard T., 4,401,524, Cl. 204-37.00R.

Eizenhoefer, Claude E. Device to melt ice and snow on a roof structure. 4,401,880, Cl. 219-213.000.

Ekholm, Carl R., to Standex International Corporation. Patient treatment table. 4,401,110, Cl. 128-70.000.

Elanchenny, Vythilingam; and Seitzer, Walter H., to Suncor, Inc. Beneficiation of froth obtained from tar sands sludge. 4,401,552, Cl. 208-11.0LE.

Electric Power Research Institute, Inc.: *See—*
Tassicker, Owen J., 4,400,971, Cl. 73-28.000.
Udren, Eric A., 4,402,028, Cl. 361-36.000.

Electro-Nite Co.: *See—*
Theuwis, Alfons L. M. C., 4,401,389, Cl. 374-140.000.

Electro-Voice, Incorporated: *See—*
Watson, Alan R., 4,401,859, Cl. 179-121.00D.

Electrolux Siegen GmbH: *See—*
Rabe, Erich, 4,401,419, Cl. 417-415.000.

Electronic Display Systems, Inc.: *See—*
Jones, Derick, 4,401,369, Cl. 350-349.000.

Eli Lilly and Company: *See—*
Kirst, Herbert A., 4,401,660, Cl. 424-180.000.
Lunn, William H. W., 4,401,668, Cl. 424-246.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,401,817, Cl. 548-136.000.

Elkins, Lincoln F., to Standard Oil Company, The. Modified in situ retorting of oil shale. 4,401,163, Cl. 166-259.000.

Elliott, Leonard R.: *See—*
Bohla, David J.; and Elliott, Leonard R., 4,401,197, Cl. 188-334.000.

Elser, Wolfgang: *See—*
Lotsch, Wolfgang; Kemper, Reinhard; Bock, Gustav; and Elser, Wolfgang, 4,401,815, Cl. 544-300.000.

Elsner, Burckhard: *See—*
Becker, Kunibert; Elsner, Burckhard; and Dunkel, Gerd, 4,401,399, Cl. 405-299.000.

Emmerling, Wolfram: *See—*
Zurner, Hans-Jurgen; Emmerling, Wolfram; and Steimer, Werner, 4,401,071, Cl. 123-276.000.

Emmett, John E., to Occidental Chemical Corporation. Piston for disc brakes. 4,401,012, Cl. 92-248.000.

Eng, Chee P., to Ayerst, McKenna & Harrison Inc. Combination of rapamycin and picibanil for the treatment of tumors. 4,401,653, Cl. 424-114.000.

Engelhardt, Friedrich; and Kleber, Rolf, to Hoechst Aktiengesellschaft. Modified polyvinyl alcohol and its use as a sizing agent. 4,401,836, Cl. 525-61.000.

Engelhardt, Werner, to Siemens Aktiengesellschaft. System for measuring the thickness of a strip emerging from a rolling mill. 4,400,958, Cl. 72-16.000.

Engle, George M., to Advanced Semiconductor Materials/AM. Method and apparatus for achieving spatially uniform externally excited non-thermal chemical reactions. 4,401,507, Cl. 156-643.000.

Engle, George M.: *See—*
Rosler, Richard S.; and Engle, George M., 4,401,687, Cl. 427-38.000.

Enright, John A.; Ives, Milton N.; and Daniels, Richard H., to North American Philips Corporation. Magnetically actuated indicator. 4,401,959, Cl. 335-272.000.

Entac Co., Ltd.: *See—*
Nozawa, Yoshikuni, 4,401,907, Cl. 310-203.000.

Epper, Wolfgang; Michalski, Lothar; and Schonteich, Peter, to Klockner-Humboldt-Deutz AG. Device for affixing a filter mesh to the drum of a rotary drum filter. 4,401,564, Cl. 210-150.000.

Epps, Fred A., to AMCA International Limited. Roller entry guide for angles. 4,400,963, Cl. 72-250.000.

Epstein, Elias, to Kaspar & Esh, Inc. Modular jewelry link. 4,400,932, Cl. 59-82.000.

Equipment Systems and Devices, Inc.: *See—*
Gitlin, Harvey S.; and Duffy, John J., 4,401,202, Cl. 194-55.000.

Eriksson, Hans; and Ronndahl, Sylve. Method of clearing away liquid. 4,401,475, Cl. 134-6.000.

Eriksson, Hans: *See—*
Aslund, Christer; Akerman, Ake; Eriksson, Hans; and Flodin, Benny, 4,401,723, Cl. 428-554.000.

Erlichman, Max, to Insulation Systems, Inc. Package for hermetically storing a shrinkable elastomeric sleeve. 4,401,218, Cl. 206-446.000.

ESCO Corporation: *See—*
Fillmore, Dale A.; and Briscoe, Terry L., 4,400,933, Cl. 59-84.000.

Esmil BV: *See—*
Klaren, Dick G., 4,401,152, Cl. 165-104.160.

Ethyl Corporation: *See—*
Shin, Kju H., 4,401,814, Cl. 544-277.000.

Ettell, Victor A.; and Babjak, Juraj, to INCO Ltd. Process for cobalt recovery from mixed sulfides. 4,401,630, Cl. 423-34.000.

Europe Outillage S.A.: *See—*
Reigner, Gerard; and Breger, Yves, 4,400,959, Cl. 72-112.000.

Euteco Impianti S.p.A.: *See—*
Canavesi, Roberto; Ligorati, Ferdinando; Ghezzi, Roberto; and Clemente, Roberto, 4,401,631, Cl. 423-54.000.

Evans, Gordon, to Chemical Waste Management Ltd. Method of PCB disposal and apparatus therefor. 4,400,936, Cl. 60-274.000.

Evans, Wilbur E.: *See—*
Fritz, Charles D.; Evans, Wilbur E.; and Cooke, Anson R., 4,401,454, Cl. 71-76.000.

Everling, Bruce: *See—*
Goodman, Toronta P.; and Everling, Bruce, 4,401,059, Cl. 123-25.00L.

Evett, Ronald C., to Raytheon Company. Distributed bus arbitration method and apparatus. 4,402,040, Cl. 364-200.000.

Ewert, Abram. Plastic molding. 4,401,705, Cl. 428-131.000.

Excelermatic Inc.: *See—*
Kraus, James H., 4,400,987, Cl. 74-200.000.

Exxon Research & Engineering Co.: *See—*
King, Terry S., 4,401,834, Cl. 568-881.000.

Exxon Reserach and Engineering Co.: *See—*
Brown, W. Sumner, 4,401,026, Cl. 101-93.330.

Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, to Ford Motor Company. Ceramic cutting tool formed from Si_3N_4-Y_2O_3-SiO_2 and method of making. 4,401,617, Cl. 264-332.000.

Fabel, George W.; and Lindahl, Richard W., to Minnesota Mining and Manufacturing Company. Electrographic recording method and apparatus with control of toner quantity at recording region. 4,402,000, Cl. 346-155.000.

Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., to Ayerst, McKenna & Harrison, Ltd. N-Substituted dimeric cyclopeptide derivatives. 4,401,656, Cl. 424-177.000.

Fair, David F. Nitrocellulose purification. 4,401,809, Cl. 536-42.000.

Fairand, Barry P.: *See—*
Clauer, Allan H.; Fairand, Barry P.; Ford, Stephen C.; and Walters, Craig T., 4,401,477, Cl. 148-4.000.

Farber, Webb W., to U.S. Solar Corporation. Self-clamping hinge for solar collector frames and the like. 4,400,847, Cl. 16-223.000.

Farge, Daniel: *See—*
Bouchaudon, Jean; Dutruc-Rosset, Gilles; Farge, Daniel; and James, Claude, 4,401,658, Cl. 424-177.000.

Faris, Sadeg M., to International Business Machines Corporation. Ultra high resolution Josephson sampling technique. 4,401,900, Cl. 307-352.000.

Farr, Glyn P. R., to Lucas Industries Limited. Hydraulic anti-skid braking systems for vehicles. 4,401,348, Cl. 303-116.000.

Farrington, Thomas A.; and Nowakowski, Tamara, to Drew Chemical Corporation. Flocculation of aqueous paint waste. 4,401,574, Cl. 210-728.000.

Fasano, Michael, to Porta Systems Corp. Gas tube protector module. 4,402,031, Cl. 361-124.000.

Faudel, Gerald B., to Tosco Corporation. System and method for lowered hydrogen sulfide emissions from oil shale. 4,401,553, Cl. 208-11.00R.

Faure, Jean-Paul: *See—*
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,401,451, Cl. 65-1.000.

Featherby, Michael: *See—*
Dietz, Raymond L.; Featherby, Michael; and Margetts, Peter K., 4,401,767, Cl. 501-19.000.

Federal Paper Board Co., Inc.: *See—*
Conroy, Betty A.; Brown, William M.; and Maio, Patrick S., 4,401,255, Cl. 229-37.00R.

Feld, Gerald M., to Trend Products Company. Steamer pot assembly. 4,401,017, Cl. 99-413.000.

Fellinger, Frank; and Ruffing, James M., to International Telephone and Telegraph Corporation. Delay correction circuit. 4,402,079, Cl. 370-84.000.

Fellman, Ronald D.: *See—*
Broderson, Robert W.; Hurst, Paul J.; and Fellman, Ronald D., 4,401,855, Cl. 179-15.55R.

Fenton, Brian P.: *See—*
Davy, John C.; Fenton, Brian P.; and Ramage, John G., 4,401,933, Cl. 318-778.000.

Ferchland, Dieter; Kussmaul, Ulrich; Langer, Manfred; and Muller, Rolf, to Cassella Aktiengesellschaft. Process for the preparation of aryl isocyanide-dichlorides. 4,401,603, Cl. 260-543.200.

Ferguson, Harry D.; and Slack, Michael K., to General Signal Corporation. Electrical synthesis of mechanical bell. 4,401,975, Cl. 340-384.00E.

Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Drive for a vehicle with an internal combustion engine and an electric motor. 4,400,997, Cl. 74-661.000.

Fibrelock Fabrics Limited: *See—*
Caldwell, Kenneth, 4,401,338, Cl. 296-1.00S.

Fichtel & Sachs AG: *See—*
Grundei, Manfred, 4,401,196, Cl. 188-282.000.
Steuer, Werner, 4,400,999, Cl. 74-781.00B.

Figler, Alan A., to Baxter Travenol Laboratories, Inc. System for reading multiplexed data. 4,401,981, Cl. 340-715.000.

Filas, Leon G. Collapsible wheelbarrow. 4,401,313, Cl. 280-47.310.

Fillmore, Dale A.; and Briscoe, Terry L., to ESCO Corporation. Connecting link. 4,400,933, Cl. 59-84.000.

Finet, Philip J.: *See—*
Woythal, Robert T.; and Finet, Philip J., 4,400,859, Cl. 29-27.00C.

Finley, Jack D.; and Whitney, Robert E., to Eikonix Corporation. Reducing flare in self-scanned photosensor arrays. 4,401,887, Cl. 250-216.000.

Firestone Tire & Rubber Company, The: *See—*
Hall, James E., 4,401,800, Cl. 526-175.000.
Hausch, Walter R., 4,401,145, Cl. 152-353.00R.

Fischer, David. Two bottle carrier. 4,401,212, Cl. 206-158.000.

Fischer, Helmut; and Steegmuller, Willi. Method of measuring thickness of a tin layer and thickness measuring device therefor. 4,401,518, Cl. 204-1.00T.

Fischer, Joseph J.: *See—*
Melissa, Raymond F.; Grummett, Lorne H.; and Fischer, Joseph J., 4,401,390, Cl. 400-240.300.

Fisher, Charles B.; and Fisher, Sidney T. AM Quadrature stereo systems. 4,401,853, Cl. 179-1.0GS.
Fisher, Hollis G. Grain loss reduction kit. 4,401,128, Cl. 130-27.00R.
Fisher, Robert J.; Jaworowicz, Arthur C.; Lyle, John M.; Sellers, Jerry W.; and Steed, Gary R., to Harman Automotive, Inc. Adjustable mirror stabilizing mounting. 4,401,289, Cl. 248-483.000.
Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,401,853, Cl. 179-1.0GS.
Fleischfresser, Marvin H.: *See*—
Wilson, Harold F.; and Fleischfresser, Marvin H., 4,401,461, Cl. 71-121.000.
Fletcher, Grant: *See*—
Garnett, John L.; Schwarz, Thomas; and Fletcher, Grant, 4,401,688, Cl. 427-43.100.
Fleuret, Daniel, to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques. Power supply bar comprising a stack of 2 n metal layers separated by 2 n dielectric layers. 4,401,844, Cl. 174-72.00B.
Flodin, Benny: *See*—
Aslund, Christer; Akerman, Ake; Eriksson, Hans; and Flodin, Benny, 4,401,723, Cl. 428-554.000.
Flow General, Inc.: *See*—
Flowers, Earl S., 4,401,636, Cl. 423-327.000.
Flow Industries, Inc.: *See*—
Archibald, William R., 4,401,345, Cl. 299-64.000.
Flower, Ronald J.: *See*—
Schneider, Alan A.; Flower, Ronald J.; Bowser, George C.; and Kenyon, Lewis C., 4,401,847, Cl. 179-1.00H.
Flowers, Earl S., to Flow General, Inc. Novel metal-micelle asbestos and treatment of asbestos and other silicate minerals to reduce their harmful properties. 4,401,636, Cl. 423-327.000.
Flowers, Jimmy D.: *See*—
Oriel, Sharon L.; and Flowers, Jimmy D., 4,401,794, Cl. 525-328.200.
Flying K Equipment System, Inc.: *See*—
Kofahl, William M., 4,401,159, Cl. 166-59.000.
FMC Corporation: *See*—
Gold, Kenneth S., 4,401,949, Cl. 324-402.000.
Schellinger, Richard, Jr., 4,401,509, Cl. 156-666.000.
Thompson, John S., 4,401,683, Cl. 426-331.000.
Williams, Michael R.; and McDonald, Dean, 4,401,264, Cl. 239-126.000.
Foley, James E. Camshaft lobes which provide selective cylinder cutout of an internal combustion engine. 4,401,069, Cl. 123-198.00F.
Fonderie et Ateliers des Sablons: *See*—
Boudin, Daniel; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,400,881, Cl. 33-126.70A.
Ford Aerospace & Communications Corporation: *See*—
Meyer, Theodore O.; and van Ommering, Gerrit, 4,401,734, Cl. 429-181.000.
Ford Motor Company: *See*—
Blair, Mark A., 4,401,326, Cl. 285-318.000.
Bookout, Charles C.; Heeney, John P.; and Murphy, Richard E., 4,400,998, Cl. 74-740.000.
Cook, Ronald A.; and Strutt, Derek W., 4,400,990, Cl. 74-492.000.
Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, 4,401,617, Cl. 264-332.000.
Gates, Freeman C., Jr.; and Purins, Egils A., 4,401,093, Cl. 123-573.000.
Rachedi, Shane H., 4,401,092, Cl. 123-568.000.
Ford, Stephen C.: *See*—
Clauer, Allan H.; Fairand, Barry P.; Ford, Stephen C.; and Walters, Craig T., 4,401,477, Cl. 148-4.000.
Forte, Paulino: *See*—
Videira, Jose A.; Forte, Paulino; and Butwell, Kenneth F., 4,401,560, Cl. 208-324.000.
Fortune, William S. Modular storage system. 4,401,350, Cl. 312-107.000.
Foschini, Giorgio: *See*—
Albizzati, Enrico; Bassi, Ivano; Foschini, Giorgio; Parodi, Sandro; and Pirinoli, Franco, 4,401,641, Cl. 423-498.000.
Foster, Harold S.: *See*—
Hume, James G.; Sidvers, John; and Foster, Harold S., 4,401,394, Cl. 400-208.000.
Foster, John R.; and Placke, James E., to Von Duprin, Inc. Means for, and a method of, securing a closure. 4,401,330, Cl. 292-300.000.
Foster Wheeler Energy Corporation: *See*—
Cope, Michael E., 4,402,082, Cl. 371-22.000.
4-S Oil Company, Inc.: *See*—
Butler, Jack B., 4,401,290, Cl. 248-565.000.
Fourno, Rene: *See*—
Charrier, Elie; and Fourno, Rene, 4,401,058, Cl. 122-17.000.
Fowler, Eugene W.; and Fowler, Raymond W. Weight or ambient pressure-responsive mechanical pressure switch. 4,401,896, Cl. 307-118.000.
Fowler, Raymond W.: *See*—
Fowler, Eugene W.; and Fowler, Raymond W., 4,401,896, Cl. 307-118.000.
Fram Corporation: *See*—
Peyton, Richard H.; and Thornton, Donald I., 4,400,864, Cl. 29-508.000.
Frank, Gunter; Kostlin, Heiner; Sprengers, Leo M.; and Campbell, Ronald J., to U.S. Philips Corporation. Method of manufacturing a heat-reflecting filter. 4,401,693, Cl. 427-160.000.
Franklin Container Corporation: *See*—
Blatt, David H., 4,401,217, Cl. 206-408.000.
Franz, Reinhard; and Dittmar, Wilfried, to Franz, Reinhard. Electronic keyboard-operated musical instrument. 4,401,005, Cl. 84-1.010.
Fraser, David B., to Bell Telephone Laboratories, Incorporated. High conductivity metallization for semiconductor integrated circuits. 4,400,867, Cl. 29-571.000.
Fratelli Musci: *See*—
Musci, Nicola, 4,400,893, Cl. 36-24.500.
Freese, Uwe E.: *See*—
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,401,534, Cl. 264-138.000.
Freitag, Dieter: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,401,802, Cl. 528-167.000.
Frelk, Elmer S., to Eaton Corporation. Integrated wire termination system terminal with fastened retainer. 4,401,359, Cl. 339-253.00R.
Frenkel, Benjamin. Building structure and the method of erecting buildings from ribbed and channelled sheets. 4,400,921, Cl. 52-284.000.
Frentress, Zane, to Milliken Research Corporation. Electronic patterning with registration control. 4,401,024, Cl. 101-93.010.
Frey, Joseph V. Dispenser for sheets of paper and the like. 4,401,233, Cl. 221-36.000.
Frey, William A.: *See*—
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A., 4,401,765, Cl. 436-533.000.
Fried. Krupp GmbH: *See*—
Suhr, Gunther; Knuth, Manfred; Malchow, Wilhelm; and Homann, Thorsten, 4,401,023, Cl. 100-148.000.
Frint, William R., to Intermountain Research and Development Corporation. Recovery of alkali values from salt-containing trona deposits. 4,401,635, Cl. 423-206.00T.
Fritchman, Jack F., to White Consolidated Industries, Inc. Muffler system for refrigeration compressor. 4,401,418, Cl. 417-312.000.
Fritz, Charles D.; Evans, Wilbur E.; and Cooke, Anson R., to Union Carbide Corporation. Growth regulation methods. 4,401,454, Cl. 71-76.000.
Frost, Charles C.: *See*—
Weis, Siegfried K.; and Frost, Charles C., 4,401,188, Cl. 184-15.00B.
Frost, Kenneth, to Chevron Research Company. Lubricant composition containing an alkali metal borate and an ester-polyol compound. 4,401,580, Cl. 252-25.000.
Fry, Stanley E.; and Hurd, Claude C., to Bear Medical Systems, Inc. Gas flow rate control device for medical ventilator. 4,401,116, Cl. 128-205.240.
Fryer, Rodney I.: *See*—
Walser, Armin; and Fryer, Rodney I., 4,401,597, Cl. 260-244.400.
Fuchs, Benjamin H., to Dresser Industries, Inc. Underreamer with debris flushing flow path. 4,401,171, Cl. 175-267.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Takano, Toshio; Mihashi, Kazutaka; and Arasawa, Kohichi, 4,401,199, Cl. 192-0.052.
Fuji Photo Film Co., Ltd.: *See*—
Ikeda, Teppei; Ishige, Sadao; Sekikawa, Nobuyoshi; Igarashi, Akira; and Sugiyama, Takekatsu, 4,401,717, Cl. 428-425.100.
Kobayashi, Kazuhiko, 4,401,504, Cl. 156-505.000.
Fuji Xerox Co., Ltd.: *See*—
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,401,993, Cl. 346-76.0PH.
Fujieda, Yasuhiko: *See*—
Amano, Itaru; and Fujieda, Yasuhiko, 4,401,422, Cl. 425-38.000.
Fujii, Masahiko: *See*—
Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, 4,401,592, Cl. 260-112.00B.
Fujii, Takayoshi: *See*—
Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, 4,401,592, Cl. 260-112.00B.
Fujimoto, Hiroaki; and Hakamata, Kyoji, to Yamaha Hatsudoki Kabushiki Kaisha. Internal combustion engine with heated intake system. 4,401,090, Cl. 123-545.000.
Fujita, Osamu, to Matsushita Electric Industrial Co., Ltd. Protective circuit for output transformer-less circuit. 4,402,029, Cl. 361-90.000.
Fujita, Shigehiko: *See*—
Yamada, Kenichi; Yokogawa, Seiji; Fujita, Shigehiko; Takenaka, Kiyoshi; and Tanoue, Koichi, 4,401,328, Cl. 289-2.000.
Fujitsu Fanuc Limited: *See*—
Nozawa, Ryoichiro; and Matsui, Mitsuo, 4,402,051, Cl. 364-475.000.
Fujitsu Limited: *See*—
Arakawa, Hideki, 4,402,064, Cl. 365-185.000.
Itoh, Hideo; and Shimada, Hiroshi, 4,402,066, Cl. 365-189.000.
Fujiwara, Akiko; Hoshino, Tatsuo; and Tazoe, Masaaki, to Hoffmann-La Roche Inc. Anthracycline antibiotics. 4,401,812, Cl. 536-6.400.
Fujiwara, Mitsuru: *See*—
Kasuya, Katsuhiko; Fujiwara, Mitsuru; Imai, Masaya; Matsunaga, Tetsuzo; and Takahashi, Yasuo, 4,401,420, Cl. 418-201.000.
Fukami, Akira: *See*—
Noguchi, Hiroki; and Fukami, Akira, 4,400,845, Cl. 15-250.420.
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Funkhouser, William A., to Albany International Corporation. Method for the distribution of biologically active chemicals. 4,401,266, Cl. 239-7.000.
Furuhashi, Shoji, to Nissan Motor Co., Ltd. Apparatus for controlling rotational speed of internal combustion engine. 4,401,073, Cl. 123-339.000.

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Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.

Fuzesi, Stephen; and Bayusik, John G., to Olin Corporation. Methyl glucoside-amine-based polyether polyols and polyurethane foams prepared therefrom. 4,401,772, Cl. 521-167.000.

G & S Screw Machine Products, Inc.: *See*—
Vaudreuil, Richard E., 4,400,878, Cl. 30-329.000.

GA Industries Inc.: *See*—
Salina, Louis E.; and Lescovich, Joseph E., 4,401,412, Cl. 417-12.000.

Gable, Gerald K.; and Dempsey, Daniel J., to Carrier Corporation. Safety switch for a combustion system. 4,401,425, Cl. 431-22.000.

Gaillard, Jean, to Institut Francais du Petrole. Process for removing halogenated impurities from olefin oligomers. 4,401,559, Cl. 208-262.000.

Gaitan, Magdha. Shower cap. 4,400,830, Cl. 2-68.000.

Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., to Thomas Jefferson University. Radioactive material loading, calibration and injection systems. 4,401,108, Cl. 128-1.100.

Gallis, Anthony J., to Harsco Corporation. Concrete wall form with safety attachment. 4,401,291, Cl. 249-196.000.

Gallop, Paul M., to Syntex (U.S.A.) Inc. Copolymers and hydrogels: process and articles made thereof. 4,401,797, Cl. 525-383.000.

Gamewell Corporation, The: *See*—
Solomon, Elias E., 4,401,978, Cl. 340-628.000.

Gardineer, Bayard G.; and Heringes, James A., to Technicare Corporation. Plumbing fitting. 4,401,882, Cl. 219-335.000.

Garlaschelli, Luigi; Gozzo, Franco; and Mirenna, Luigi, to Montedison S.p.A. Fungicidal carbazates. 4,401,675, Cl. 424-285.000.

Garnett, John L.; Schwarz, Thomas; and Fletcher, Grant, to Unisearch Limited (N.S.W.)Australia. Imparting permanent press characteristics. 4,401,688, Cl. 427-43.100.

Garrett, Betty Ann: *See*—
Morris, Donald G., 4,401,943, Cl. 324-157.000.

Garrett Corporation, The: *See*—
Earl, Robert W., 4,401,077, Cl. 123-376.000.

Garvey Corporation: *See*—
Garvey, Francis J., 4,401,207, Cl. 198-580.000.

Garvey, Francis J., to Garvey Corporation. Product accumulator. 4,401,207, Cl. 198-580.000.

Gates, Freeman C., Jr.; and Purins, Egils A., to Ford Motor Company. Oil fill/air breather cap with integral oil separator. 4,401,093, Cl. 123-573.000.

Gatewood, Sidney U., to Borg-Warner Corporation. Clutch driven plate assembly. 4,401,201, Cl. 192-106.200.

Gator Manufacturing, Inc.: *See*—
Connolly, John E.; and Huggett, Mark D., 4,401,030, Cl. 101-316.000.

Gaudet, Henri, to Cie Miniere de l'Ogooue (COMILOG). Aerial cableway having a return sheave with a speed stabilization device. 4,401,034, Cl. 104-178.000.

Gautier, Jean-Claude: *See*—
Tellier, Jacques; Sirvins, Andre; Gautier, Jean-Claude; and Tramier, Bernard, 4,401,762, Cl. 435-243.000.

GCA Corporation: *See*—
Lawson, Robert M., 4,401,131, Cl. 134-149.000.

General Electric Company: *See*—
Axelrod, Robert J.; Liberti, Frank N.; and Semen, John, 4,401,792, Cl. 525-175.000.
Berges, David E., 4,400,872, Cl. 29-598.000.
Conger, Ronald R., 4,401,905, Cl. 307-546.000.
Kindig, Alan L.; and Wesseldyk, Albert J., 4,400,873, Cl. 29-753.000.
Knight, Wesley W., 4,402,012, Cl. 358-160.000.
Lee, Minyoung; and Szala, Lawrence E., 4,401,443, Cl. 51-307.000.
Liu, Ping Y.; and Miller, Kenneth F., 4,401,785, Cl. 524-508.000.
Martzloff, Francois D.; and Jones, Marshall G., 4,401,912, Cl. 313-17.000.
Medford, George F., 4,401,718, Cl. 428-448.000.
Modic, Frank J., 4,401,491, Cl. 156-48.000.
Selin, Terry G., 4,401,826, Cl. 556-429.000.
Smith, Peter C., 4,401,608, Cl. 264-0.500.
Walker, George L., Jr., 4,401,008, Cl. 89-33.0BB.

General International Corporation: *See*—
DeJong, Peter G., 4,401,109, Cl. 128-41.000.

General Motors Corporation: *See*—
Ankrapp, John H.; Holzen, Donald J.; and Rinke, Donald F., 4,401,340, Cl. 296-93.000.

General Signal Corporation: *See*—
Dobrzanski, John J., 4,401,979, Cl. 340-629.000.
Ferguson, Harry D.; and Slack, Michael K., 4,401,975, Cl. 340-384.00E.
Hartung, Russell M.; Appleman, Larry; and Alexander, Warren R., 4,402,038, Cl. 362-20.000.
Newton, Ronald O.; Shute, Bruce W.; and Allen, John J., Jr., 4,402,047, Cl. 364-426.000.

General Steel Industries, Inc.: *See*—
DeVita, Achilles P.; and Watkins, Manley C., 4,401,279, Cl. 241-236.000.

Gerber, Arthur H., to Martin Marietta Corporation. Hydraulic cement mixes and processes for improving hydraulic cement mixes. 4,401,472, Cl. 106-90.000.

Gerber Garment Technology, Inc.: *See*—
Gerber, Heinz J.; and Pearl, David R., 4,401,001, Cl. 83-451.000.

Gerber, Heinz J.; and Pearl, David R., to Gerber Garment Technology, Inc. Apparatus for cutting sheet material with a cutting wheel. 4,401,001, Cl. 83-451.000.

Gerber, Richard: *See*—
Brand, Gunter; Gerber, Richard; Ehrmann, Karl; Kaufmann, Reinhold; and Kalippke, Harald, 4,401,066, Cl. 123-146.50A.

Gerhardson, Gunnar D., to AB Jonkoping-Vulcan. Method of molding a perforated article. 4,401,615, Cl. 264-119.000.

Gerken, Carl F., to American Standard Inc. Counter-rotating trolley and track suspension system. 4,401,033, Cl. 104-94.000.

Germaine, Michel. Appliance for picking up very small elements one by one. 4,401,236, Cl. 221-211.000.

Gerritsen, Jan, to U.S. Philips Corporation. Color display tube including cylindrical dipole correction magnets. 4,401,917, Cl. 313-413.000.

Gershuny, Hyman. Therapeutic appliance. 4,401,117, Cl. 128-206.110.

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Becker, Kunibert; Elsner, Burckhard; and Dunkel, Gerd, 4,401,399, Cl. 405-299.000.

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Sommer, Albrecht; and Sparenberg, Heinrich, 4,401,397, Cl. 405-133.000.

Gfeller, Fritz R.; and Mueller, Hans R., to International Business Machines Corp. Communication system in which data are transferred between terminal stations and satellite stations by infrared signals. 4,402,090, Cl. 455-601.000.

Ghezzi, Roberto: *See*—
Canavesi, Roberto; Ligorati, Ferdinando; Ghezzi, Roberto; and Clemente, Roberto, 4,401,631, Cl. 423-54.000.

Ghiringhelli, Hugh A., to TS Leasing Associates. Process for thermally expanding silicate-based material by an infrared heat source. 4,401,586, Cl. 252-378.00R.

Giacobbe, Thomas J.; and Tsien, Grace, to Rhone-Poulenc Agrochimie. Use of calcium chloride to minimize hydrofluoric acid corrosion to glass during the chlorination of 4-chlorobenzotrifluoride. 4,401,623, Cl. 422-1.000.

Gibert, Pierre. Articulated vehicle. 4,401,408, Cl. 414-687.000.

Gideon, Charles M., to Halliburton Company. Enhanced oil recovery methods and systems. 4,401,789, Cl. 524-827.000.

Giguere, Jean P., to Donat Flamand Inc. Catch member. 4,400,923, Cl. 52-455.000.

Gilliam, Rudolph V.: *See*—
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,401,108, Cl. 128-1.100.

Gillis, Steven, to Immunex Corporation. Process for preparing human interleukin 2. 4,401,756, Cl. 435-68.000.

Gilvar, Martin; and Russell, Robert B., to Morgan Construction Company. Steel rod rolling process, product and apparatus. 4,401,481, Cl. 148-12.00B.

Gingher, Clair H., Jr., to Gingher, Inc. Thread nip. 4,400,877, Cl. 30-253.000.

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Gingher, Clair H., Jr., 4,400,877, Cl. 30-253.000.

Girault, Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Girault, Pierre, 4,401,673, Cl. 424-263.000.

Gisler, Henry J., to Joy Manufacturing Company. Lime slaking method. 4,401,645, Cl. 423-640.000.

Gitlin, Harvey S.; and Duffy, John J., to Equipment Systems and Devices, Inc. Coin slide with interchangeable cores. 4,401,202, Cl. 194-55.000.

Glans, Jan-Erik; and Martensson, Arvid, to Tetra Pak International AB. Arrangement to reduce the thickness of a moving material web. 4,401,004, Cl. 83-875.000.

Glenny, Alfred E. T.; van Vliet, Johannes A. J. M.; and Weerdesteijn, Petrus A. M., to U.S. Philips Corporation. High-pressure discharge lamp. 4,401,916, Cl. 313-628.000.

Glover, Russell K., Jr.: *See*—
Jones, Jack D.; and Glover, Russell K., Jr., 4,401,346, Cl. 292-144.000.

Gnanamuthu, Daniel S., to Avco Everett Research Laboratory, Inc. Metal surface modification. 4,401,726, Cl. 428-610.000.

GNB Batteries Inc.: *See*—
Szymborski, Joseph; Misra, Sudhansu S.; Eggers, Mark L.; and Burrows, Brian W., 4,401,730, Cl. 429-53.000.

Godat, Jean: *See*—
Boudin, Daniel; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,400,881, Cl. 33-126.70A.

Godbersen, Byron L. Boat hoist. 4,401,335, Cl. 294-84.000.

Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., to University Patents, Inc.; and Contracap, Inc. Conforming valved cervical cap assembly and in-situ molding method. 4,401,534, Cl. 264-138.000.

Goeth, Hanns: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,401,667, Cl. 424-246.000.

Gohara, Yoshihiro: *See*—
Matsushita, Yukio; and Gohara, Yoshihiro, 4,401,061, Cl. 123-41.840.

Goiffon, John J.; and Thawley, S. Tom, to Tele-Drill Inc,. Heat sink-/retainer clip for a downhole electronics package of a measurements-while-drilling telemetry system. 4,400,858, Cl. 24-255.0BS.

Gokimoto, Hiroyuki: *See*—
Chihara, Takeshi; and Gokimoto, Hiroyuki, 4,401,344, Cl. 297-367.000.

Gold, Kenneth S., to FMC Corporation. External device identification system. 4,401,949, Cl. 324-402.000.

Goldberg, Jerrold. Etched photographic imagery. 4,401,750, Cl. 430-323.000.

Goldman, Fred M.: *See—*
Csaszar, Gabor; Goldman, Fred M.; Oehley, Gernot; and Svoboda, Edward J., 4,401,089, Cl. 123-536.000.

Goodman, Donald: *See—*
Ceprini, Mario Q.; Goodman, Donald; and Hoch, Samuel, 4,401,798, Cl. 526-84.000.

Goodman System Company, Inc.: *See—*
Goodman, Toronta P.; and Everling, Bruce, 4,401,059, Cl. 123-25.00L.
Goodman, Toronta P., 4,401,060, Cl. 123-25.00R.

Goodman, Toronta P.; and Everling, Bruce, to Goodman System Company, Inc. Fluid injection system, and flow control device used therein, for an internal combustion engine. 4,401,059, Cl. 123-25.00L.

Goodman, Toronta P., to Goodman System Company, Inc. Fluid injection system for a supercharged internal combustion engine. 4,401,060, Cl. 123-25.00R.

Goodrich, John E.: *See—*
Halford, George C.; and Goodrich, John E., 4,401,130, Cl. 132-88.500.

Goodyear Tire & Rubber Company, The: *See—*
Balogh, George F., 4,401,838, Cl. 585-860.000.

Gorsek, Edmund J., to Dickey-john Corporation. Grain sensor using a piezoelectric element. 4,401,909, Cl. 310-323.000.

Goth, George R.; Magdo, Ingrid E.; and Malaviya, Shashi D., to International Business Machines Corporation. Self-aligned metal process for integrated circuit metallization. 4,400,865, Cl. 29-571.000.

Goto, Kunio: *See—*
Wada, Yoshiyo; Kinjo, Hisao; Ozawa, Keiji; Tatsuguchi, Kazuo; Goto, Kunio; and Hirata, Atsumi, 4,402,018, Cl. 358-342.000.

Goto, Sotomi: *See—*
Nomura, Isao; Hori, Masayoshi; Goto, Sotomi; and Kittaka, Hirokazu, 4,401,715, Cl. 428-306.600.

Gotoh, Masami: *See—*
Hayakawa, Nobuo; Ohashi, Yasuo; Ohta, Kenji; Takagi, Yasumasa; and Gotoh, Masami, 4,400,844, Cl. 15-250.160.

Gottling, Helmut: *See—*
Rodewald, Gerhard; Opel, Detlef; Brausfeld, Walter; Gottling, Helmut; Meyer, Hans-Friedrich; and Moller, Rudolf, 4,401,293, Cl. 251-324.000.

Gotz, Manfred K.: *See—*
Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., 4,401,656, Cl. 424-177.000.

Goudy, Paul R., Jr. Fuel preparation and burning system. 4,401,039, Cl. 110-347.000.

Gould Inc.: *See—*
Brown, Arling D., Jr., 4,401,999, Cl. 346-154.000.

Gozzo, Franco: *See—*
Garlaschelli, Luigi; Gozzo, Franco; and Mirenna, Luigi, 4,401,675, Cl. 424-285.000.

Graczyk, Lawrence S.: *See—*
Royal, John H.; Graczyk, Lawrence S.; and Owens, William J., 4,401,155, Cl. 165-166.000.

Graham Magnetics, Inc.: *See—*
Sanderson, Robert A., 4,400,846, Cl. 15-306.00A.

Graiff, L. B.; and Kiovsky, T. E., to Shell Oil Company. Fuel and lubricant compositions for octane requirement reduction. 4,401,439, Cl. 44-63.000.

Grammel, Jurgen: *See—*
Pedain, Josef; Thoma, Wilhelm; Grammel, Jurgen; and Schroer, Walter, 4,401,801, Cl. 528-67.000.

Granetzke, Dennis C.: *See—*
Costello, Norman F.; and Granetzke, Dennis C., 4,401,091, Cl. 123-557.000.

Granges NYBY AB: *See—*
Aslund, Christer; Akerman, Ake; Eriksson, Hans; and Flodin, Benny, 4,401,723, Cl. 428-554.000.

Grant, Willie T. Self-operated air register damper. 4,401,260, Cl. 236-9.00A.

Grantham, Daniel H.; and Swindal, James L., to United Technologies Corporation. Method for pattern masking objects and the products thereof. 4,401,367, Cl. 350-162.220.

Grapha-Holding AG: *See—*
Muller, Hans, 4,401,299, Cl. 270-54.000.

Graphic Controls Corporation: *See—*
Hausner, George G., Jr., 4,401,997, Cl. 346-137.000.

Grass, Alfred. Door hinge with a sliding catch. 4,400,848, Cl. 16-332.000.

Graumlich, William H.: *See—*
Kaminski, David C.; and Graumlich, William H., 4,401,866, Cl. 200-61.880.

Gray, Jack, to United States of America, Army. Hybrid velocity derived heading reference system. 4,402,049, Cl. 364-447.000.

Gray, Thomas J., to Olin Corporation. Raney nickel hydrogen evolution cathode. 4,401,529, Cl. 204-95.000.

Graziani, Kenneth R.: *See—*
Choi, Byung C.; and Graziani, Kenneth R., 4,401,554, Cl. 208-64.000.

Green, Brian R.: *See—*
Hancock, Robert D.; and Green, Brian R., 4,401,629, Cl. 423-24.000.

Green, Gordon J.; and deBruyn, Robert J. Traffic control system. 4,401,969, Cl. 340-41.00R.

Green, Martin L.; and Sherwood, Richard C., to Bell Telephone Laboratories, Incorporated. Fe—Cr—Co Magnets by powder metallurgy processing. 4,401,482, Cl. 148-104.000.

Green, Milton, to Polaroid Corporation. Sunscreen method. 4,401,649, Cl. 424-60.000.

Greenberg, Charles B., to PPG Industries, Inc. Thermochromic vanadium oxide with depressed switching temperature. 4,401,690, Cl. 427-87.000.

Greenberg, Roland; Cushman, David W.; Vogt, B. Richard; Weisenborn, Frank L.; and Antonaccio, Michael J., to E. R. Squibb & Sons, Inc. Enkephalinase inhibitors. 4,401,677, Cl. 424-317.000.

Gregorius, Klaus: *See—*
Janner, Karl; and Gregorius, Klaus, 4,401,627, Cl. 422-186.000.

Greul, Helmut W.: *See—*
Walter, Leo; and Greul, Helmut W., 4,401,354, Cl. 339-19.000.

Grey, Vincent G. Safety control system for container operations. 4,401,185, Cl. 182-93.000.

Griffin, T. Scott: *See—*
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,401,670, Cl. 424-250.000.

Grimm, Forrest R.: *See—*
Backlund, Sven; and Grimm, Forrest R., 4,401,965, Cl. 337-408.000.

Gross, Pavel; and Kohout, Jaroslav. Combined indicating apparatus for scuba divers. 4,400,977, Cl. 73-432.00R.

Groundwater Decontamination Systems, Inc.: *See—*
Jhaveri, Vidyut; Mazzacca, Alfred J.; and Snyder, Harold, 4,401,569, Cl. 210-610.000.

Grover, Raymond H., to Owens-Corning Fiberglas Corporation. Speed control apparatus for winding linear material. 4,401,924, Cl. 318-6.000.

Gruenfeld, Norbert, to Ciba-Geigy Corporation. 1-Carboxyalkanoyl-1,2,3,4-tetrahydroquinoline-2-carboxylic acids. 4,401,818, Cl. 546-165.000.

Grummett, Lorne H.: *See—*
Melissa, Raymond F.; Grummett, Lorne H.; and Fischer, Joseph J., 4,401,390, Cl. 400-240.300.

Grundei, Manfred, to Fichtel & Sachs AG. Hydraulic vibration damper with noise reduction damping valves. 4,401,196, Cl. 188-282.000.

Grunst, Heinz, to Starkstrom Gummersbach GmbH. Switching device with forced opening of the contacts. 4,401,867, Cl. 200-76.000.

GTE Automatic Electric Labs Inc.: *See—*
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,402,077, Cl. 370-63.000.

GTE Products Corporation: *See—*
Arbie, John A., Sr., 4,401,276, Cl. 241-29.000.
Koza, Francis R.; and Parrott, Richard A., 4,401,913, Cl. 313-25.000.

Guarracini, Joseph; and Walentine, Joseph L., to RCA Corporation. Video disc mastering using gimballed air puck. 4,402,072, Cl. 369-132.000.

Guay, Raymond; and Moffatt, Pierre R., to Boivin, Louis. Electronic hydrometer and method of determining the density of a liquid. 4,400,978, Cl. 73-453.000.

Guess, Joe F.; Dietz, Dennis R.; and Hottinger, Charles F., to Technicare Corporation. Reflection enhancement of a biopsy needle. 4,401,124, Cl. 128-660.000.

Gulf & Western Manufacturing Company: *See—*
Lankston, Robert J., 4,401,133, Cl. 137-268.000.

Gunther, Paul, to Salzle, Erich. Process and an apparatus for extracting fine droplets of paint from paint-spraying units. 4,401,051, Cl. 118-326.000.

Gutermuth, Paul; and Oetjen, Heinrich. Fire resistant sub-ceiling. 4,401,165, Cl. 169-54.000.

Guttag, Karl M., to Texas Instruments Incorporated. Microprocessor system with instruction pre-fetch. 4,402,042, Cl. 364-200.000.

Guttag, Karl M.; McDonough, Kevin C.; and Laws, Gerald E., to Texas Instruments Incorporated. Microprocessor with compressed control ROM. 4,402,043, Cl. 364-200.000.

Guttag, Karl M.: *See—*
McDonough, Kevin C.; and Guttag, Karl M., 4,402,044, Cl. 364-200.000.

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Boyer, Keith D., 4,400,922, Cl. 52-394.000.

Haack, Werner, to Brevet AG. Sliding weight scale. 4,401,177, Cl. 177-250.000.

Haase, Elmer A., to Bendix Corporation, The. Fuel distribution system for an internal combustion engine. 4,401,063, Cl. 123-73.00B.

Haber, Terry M.; and Smedley, William H. Intestinal control valve. 4,401,107, Cl. 128-1.00R.

Hagarty, Jon R., to International Harvester Co. Single gear opposed reaction transmission brake. 4,400,988, Cl. 74-411.500.

Hagiwara, Hiroshi; and Iwasaki, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing graft copolymer. 4,401,806, Cl. 528-498.000.

Hakamata, Kyoji: *See—*
Fujimoto, Hiroaki; and Hakamata, Kyoji, 4,401,090, Cl. 123-545.000.

Hakamata, Tokuichi: *See—*
Shimmura, Shuzaburo; Hakamata, Tokuichi; and Takemoto, Masahiro, 4,401,094, Cl. 123-576.000.

Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., to Caterpillar Tractor Co. Vehicle steering brake and clutch control. 4,401,132, Cl. 137-1.000.

Halbrand, Inc.: *See—*
Halford, George C.; and Goodrich, John E., 4,401,130, Cl. 132-88.500.

Haley, Paul H.: *See—*
Osborne, Robert L.; Haley, Paul H.; and Jennings, Stephen J., 4,402,054, Cl. 364-554.000.

Halford, George C.; and Goodrich, John E., to Halbrand, Inc. Swab article. 4,401,130, Cl. 132-88.500.

Hall, James D.: *See—*
Stone, Lyndon R.; and Hall, James D., 4,402,052, Cl. 364-506.000.

Hall, James E., to Firestone Tire & Rubber Company, The. Lithium alkoxide diamines as modifiers for polymerization of dienes using lithium-based initiators. 4,401,800, Cl. 526-175.000.

Hall, John L. Snap closure. 4,401,230, Cl. 220-339.000.

Haller, Klaus: *See—*
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,400,860, Cl. 29-157.00R.

Halliburton Company: *See—*
Gideon, Charles M., 4,401,789, Cl. 524-827.000.

Hallquist, Lisa G.: *See—*
Ward, Irl E., Jr.; Hallquist, Lisa G.; and Hurley, Thomas J., 4,401,747, Cl. 430-258.000.
Ward, Irl E., Jr.; and Hallquist, Lisa G., 4,401,748, Cl. 430-258.000.

Hamada, Mitsuo; and Yasuda, Sadami, to Dow Corning Corporation. Primer composition used for adhesion. 4,401,500, Cl. 156-307.500.

Hamano, Isao; and Yabunaka, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Method of connecting armature coil. 4,401,252, Cl. 228-110.000.

Hamano, Nobuo, to Tomy Kogyo Co., Inc. Electronic tennis game with interactive controls. 4,401,304, Cl. 273-85.00G.

Hamblin, David S.: *See—*
Constable, Michael J.; and Hamblin, David S., 4,401,232, Cl. 220-450.000.

Hamilton, Noble E., to Duracell Inc. Fluid cathode depolarized cell. 4,401,732, Cl. 429-105.000.

Hammelmann, Paul. Hydraulic pressure transformer. 4,401,415, Cl. 417-270.000.

Hammond, Gerald C., to Vanderhoff Communications Ltd. Speech and data communication network. 4,402,073, Cl. 370-9.000.

Hance, James C., to Olin Corporation. Shoe insole having antibacterial and antifungal properties. 4,401,770, Cl. 521-120.000.

Hancock, Robert D.; and Green, Brian R., to National Institute for Metallurgy. Selective imidazole ion exchange resins. 4,401,629, Cl. 423-24.000.

Hang, Kenneth W.: *See—*
Prabhu, Ashok N.; and Hang, Kenneth W., 4,401,709, Cl. 428-209.000.

Hansen, Dennis D., to Minnesota Mining and Manufacturing Company. Aerosal fan spray head. 4,401,271, Cl. 239-337.000.

Hansen, John H.: *See—*
Conklin, Delano M.; Hansen, John H.; and Hodgin, John B., 4,401,782, Cl. 524-313.000.

Hanson, Richard A.; and Atherton, Kim W., to Sundstrand Data Control, Inc. Force transducer flexure with conductors on surfaces in the neutral bending plane. 4,400,979, Cl. 73-517.00B.

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Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.

Harada, Kazuo: *See—*
Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, 4,401,278, Cl. 241-46.170.

Harbeson, William D., to Kay Elemetrics Corp. Speech analysis apparatus. 4,401,850, Cl. 179-1.05C.

Harding Carpets Limited: *See—*
Zegota, Michael, 4,401,704, Cl. 428-95.000.

Hardy, Eugene C.; and Miklos, Milan J., to International Business Machines Corporation. Sheet separation apparatus and method. 4,401,302, Cl. 271-251.000.

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Fisher, Robert J.; Jaworowicz, Arthur C.; Lyle, John M.; Sellers, Jerry W.; and Steed, Gary R., 4,401,289, Cl. 248-483.000.

Harper, William P.; and DeVries, Donald H., to Rogers Corporation. Miniaturized bus bars and methods of fabrication thereof. 4,401,843, Cl. 174-72.00B.

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Noll, Harry C., Jr., 4,401,021, Cl. 100-14.000.
Pospisil, Robert S., 4,401,940, Cl. 323-365.000.
Sanders, Thomas J.; and White, William H., 4,402,002, Cl. 357-42.000.
Taylor, David L., 4,402,065, Cl. 365-189.000.

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Gallis, Anthony J., 4,401,291, Cl. 249-196.000.

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Zamiska, Frank P.; and Tipton, Norman B., 4,401,542, Cl. 204-213.000.

Hartlaub, Jerome T.; and McDonald, Ray S., to Medtronic, Inc. Digital cardiac pacemaker with program acceptance indicator. 4,401,120, Cl. 128-419.0PT.

Hartshorn, Frank; le Vesconte, Ivor J. R.; Murphy, Brian J. M.; and Storer, Richard E., to USM Corporation. Machine for lasting heel seat portions of shoes. 4,400,839, Cl. 12-12.500.

Hartung, Russell M.; Appleman, Larry; and Alexander, Warren R., to General Signal Corp. Automatic lamp bulb changer for signal lamps. 4,402,038, Cl. 362-20.000.

Hasegawa, Shumpei: *See—*
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,401,080, Cl. 123-440.000.

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Kato, Yoshito; Matsubara, Hideyuki; and Hashimoto, Toshio, 4,401,930, Cl. 318-603.000.
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Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Ohira, Eiji, 4,401,849, Cl. 179-1.0SC.

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Miura, Kazuhiko; Kawabata, Takakazu; Hattori, Tadashi; and Ueno, Yoshiki, 4,401,948, Cl. 324-378.000.

Hauni-Werke Korber & Co. KG: *See—*
Komossa, Werner; and Ramsch, Gerhard, 4,401,205, Cl. 198-524.000.

Hausch, Walter R., to Firestone Tire & Rubber Company, The. Ambient temperature application of indicia to elastomer substrates. 4,401,145, Cl. 152-353.00R.

Hausfeld, A. David. Isoelectric focusing techniques and devices. 4,401,538, Cl. 204-180.00P.

Hausner, George G., Jr., to Graphic Controls Corporation. Chart having improved separability from a stacked array. 4,401,997, Cl. 346-137.000.

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Hayden, Harold R.: *See—*
Peik, Jerry A.; Steenbergen, Suzanna M.; and Hayden, Harold R., 4,401,760, Cl. 435-101.000.

Hayskar, Robert A., to Xerox Corporation. Sheet feeder controlled by fed sheet. 4,401,301, Cl. 271-96.000.

Hazan, Jean-Pierre: *See—*
Steers, Michel; and Hazan, Jean-Pierre, 4,400,838, Cl. 8-158.000.

Hazel, Robert L.; and LaBudde, Edward V., to Burroughs Corporation. Preformatted optical media for use in an optical memory system. 4,402,061, Cl. 365-127.000.

Heeney, John P.: *See—*
Bookout, Charles C.; Heeney, John P.; and Murphy, Richard E., 4,400,998, Cl. 74-740.000.

Hegedus, Allan J., to Mobil Oil Corporation. Efflux viscosity cup. 4,400,973, Cl. 73-56.000.

Heidemeyer, Paulus; Bigalke, Erhard; Zimmermann, Frank; and Werner, Hartmut, to Volkswagenwerk Aktiengesellschaft. Arrangement for automatic clutch actuation. 4,401,200, Cl. 192-0.076.

Heidenreich, David C., to Power Transmssion Technology, Inc. Torque limiting clutch. 4,401,426, Cl. 464-41.000.

Heimann, Eberhard: *See—*
Diederich, Gerd; Solmecke, Rolf; Husselmann, Hans; Heimann, Eberhard; and Schauffele, Frithjof, 4,401,243, Cl. 222-591.000.

Heinl, Ernst: *See—*
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Heinrich, Erich: *See—*
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Heinrich Wunder GmbH Co. KG: *See—*
Zoor, Reinhold, 4,401,247, Cl. 224-315.000.

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Distler, Walter; and Heinzelmann, Karl-Georg, 4,402,085, Cl. 378-15.000.

Heisey, Jay M., to AMP Incorporated. Connector system for connecting a ceramic substrate to a printed circuit board. 4,401,352, Cl. 339-17.0CF.

Helms, Charles R., to Container Corporation of America. Container closure sealing member and method of forming. 4,401,231, Cl. 220-359.000.

Helms, Charles R., to Container Corporation of America. Composite molded plastic and paperboard dispensing device. 4,401,248, Cl. 225-47.000.

Helms, Charles R.: *See—*
Bell, Richard L.; and Helms, Charles R., 4,401,229, Cl. 220-259.000.

Henderson, Charles T. Process for removing precious metals from ore. 4,401,468, Cl. 75-105.000.

Henderson, John G. N.: *See—*
Knight, Stanley P.; and Henderson, John G. N., 4,402,089, Cl. 455-186.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Scheuffgen, Ingeborg, 4,401,664, Cl. 424-365.000.

Hennessy, James J., to Hennessy Products, Incorporated. Sliding door operating means. 4,400,914, Cl. 49-362.000.

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Hennessy, James J., 4,400,914, Cl. 49-362.000.

Henning, Paul N.: *See—*
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Henrich, Hans: *See—*
Thumm, Helmut; Bahr, Theodor; and Henrich, Hans, 4,401,277, Cl. 241-38.000.

Hensley, George H.; and Hensley, Raymond E. Method of producing a high energy plasma for igniting fuel. 4,402,036, Cl. 361-257.000.
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Hensley, George H.; and Hensley, Raymond E., 4,402,036, Cl. 361-257.000.
Heringes, James A.: *See—*
Gardineer, Bayard G.; and Heringes, James A., 4,401,882, Cl. 219-335.000.
Herman, Daniel F.; and Kruse, Uno, to NL Industries Inc. Polymeric polyelectrolytes. 4,401,795, Cl. 525-327.800.
Hermann Berstorff Maschinenbau GmbH: *See—*
Anders, Dietmar, 4,401,421, Cl. 425-71.000.
Hermansdorfer, James E.; and Spurgin, William T., to Sperry Corporation. Synchro-to-step data converter. 4,401,932, Cl. 318-696.000.
Herpers, Lodewijk-Jozef, to Medtronic, Inc. Prolongation of timing intervals in response to ectopic heart beats in atrial and ventricular pacemakers. 4,401,119, Cl. 128-419.0PG.
Hertel, Helfried, to Ciba-Geigy Corporation. Apparatus for this application of an adhesive web longitudinally and with U-shaped section about the edge of a sheet metal panel or the like shaped part of sheet metal. 4,401,503, Cl. 156-461.000.
Hesse, Wolfgang: *See—*
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,400,860, Cl. 29-157.00R.
Hessler, Edward J.: *See—*
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Heubner, Ulrich: *See—*
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Hibst, Hartmut; and Jakusch, Helmut, to BASF Aktiengesellschaft. Preparation of finely divided barium ferrite of high coercivity. 4,401,643, Cl. 423-594.000.
Hida, Yoshiaki, to Dai Nippon Insatsu Kabushiki Kaisha. Thermosensitive recording materials. 4,401,721, Cl. 428-484.000.
Higashionji, Masaru: *See—*
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Highland Manufacturing & Sales Co.: *See—*
Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., 4,401,700, Cl. 428-17.000.
Highlander, Sarah K.: *See—*
Manis, Jack J.; and Highlander, Sarah K., 4,401,761, Cl. 435-172.000.
Higo, Shoichi: *See—*
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,401,902, Cl. 307-415.000.
Higuchi, Shigemitsu: *See—*
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Hijikata, Kunio: *See—*
Yabe, Akira; Mori, Yasuo; and Hijikata, Kunio, 4,401,148, Cl. 165-1.000.
Hildreth, Michael S. Hair sectioning tool. 4,400,879, Cl. 132-151.000.
Hill, Alvin M.: *See—*
Kadlecik, Jack; and Hill, Alvin M., 4,401,249, Cl. 225-97.000.
Hillberg, Robert L.; and Stevens, Frederick F. Multi-barrel handgun firing mechanism. 4,400,900, Cl. 42-69.00R.
Hillberg, Robert L., to COP, Inc. Firearm having inertially responsive safety mechanism. 4,400,901, Cl. 42-70.00F.
Hilti Aktiengesellschaft: *See—*
Kessler, Jurgen, 4,401,172, Cl. 175-283.000.
Hirabayashi, Hirokazu; Tomioka, Hirotaka; and Yamagata, Shuji, to Nissan Motor Co., Ltd. Panel reinforcement structure construction. 4,401,341, Cl. 296-185.000.
Hiraguri, Seisuke, to Victor Company of Japan, Ltd. Tracking control system in a magnetic recording and/or reproducing apparatus. 4,402,023, Cl. 360-77.000.
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Hirota, Akira; and Hiraguri, Seisuke, 4,402,022, Cl. 360-77.000.
Hirai, Syoichi: *See—*
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Hirano, Hirofumi, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Printing mechanism. 4,401,027, Cl. 101-106.000.
Hirata, Atsumi: *See—*
Wada, Yoshiyo; Kinjo, Hisao; Ozawa, Keiji; Tatsuguchi, Kazuo; Goto, Kunio; and Hirata, Atsumi, 4,402,018, Cl. 358-342.000.
Hirayama, Toshikazu: *See—*
Doi, Yoshihiko; Hirayama, Toshikazu; Miyawaki, Yasushi; and Maruyama, Masao, 4,401,297, Cl. 266-252.000.
Hirohata, Michio; and Ikari, Hideo, to Canon Kabushiki Kaisha. Camera having automatic focus function and automatic exposure function. 4,401,378, Cl. 354-195.000.
Hirota, Akira; and Hiraguri, Seisuke, to Victor Company of Japan, Ltd. Tracking control system in a magnetic reproducing apparatus. 4,402,022, Cl. 360-77.000.
Hisano, Katsukuni; Ikeuchi, Kazuo; Nishimura, Makoto; Sibaoka, Hazime; Namura, Kiyoshi; Isida, Akira; and Oyabu, Katsumi, to Hitachi, Ltd. Device for connecting turbine blades. 4,401,411, Cl. 416-196.00R.
Hisey, Elmer: *See—*
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Hitachi Automotive Engineering Co., Ltd.: *See—*
Sano, Yukinori; Hoshi, Yoshikazu; and Takahashi, Ikuo, 4,401,076, Cl. 123-357.000.
Hitachi Koki Company, Limited: *See—*
Sekizawa, Masaaki; and Sasaki, Yasuo, 4,401,167, Cl. 173-162.00H.
Hitachi, Ltd.: *See—*
Abe, Katsuo; Kobayashi, Shigeru; Kamei, Tsuneaki; Tateishi, Hideki; and Aiuchi, Susumu, 4,401,539, Cl. 204-192.00R.
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Kamata, Yasuji; Kuwahara, Hiroshi; Ide, Jushi; Yamashita, Kenkichi; and Takahashi, Koji, 4,401,922, Cl. 315-368.000.
Kasuya, Katsuhiko; Fujiwara, Mitsuru; Imai, Masaya; Matsunaga, Tetsuzo; and Takahashi, Yasuo, 4,401,420, Cl. 418-201.000.
Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.
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Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, 4,400,974, Cl. 73-118.000.
Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, 4,401,971, Cl. 340-52.00F.
Sano, Yukinori; Hoshi, Yoshikazu; and Takahashi, Ikuo, 4,401,076, Cl. 123-357.000.
Tokinage, Daizo; Kobayashi, Teruaki; Yuasa, Mitsuyoshi; Itoh, Michio; and Yasuda, Kazuo, 4,401,387, Cl. 356-341.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, 4,401,278, Cl. 241-46.170.
Hiyoshi, Kazuhiko; and Sugizaki, Atsushi, to Asahi-Dow Limited. Vinylidene chloride copolymer latex. 4,401,788, Cl. 524-714.000.
Hoch, Samuel: *See—*
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Hodgin, John B.: *See—*
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Hoechst Aktiengesellschaft: *See—*
Andra, Klaus; Hutschenreuter, Elfriede; and Seifried, Walter, 4,401,135, Cl. 138-118.100.
Eckardt, Peter; and Dursch, Walter, 4,401,471, Cl. 106-87.000.
Engelhardt, Friedrich; and Kleber, Rolf, 4,401,836, Cl. 525-61.000.
Hultzsch, Kurt; and Rudolphy, Albert, 4,401,791, Cl. 525-132.000.
Kleiner, Hans-Jerg; Knittel, Volker; and Debus, Gerhard, 4,401,473, Cl. 106-109.000.
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Steppan, Hartmut; Wildenhain, Barbara; and Ruckert, Hans, 4,401,520, Cl. 204-11.000.
ter Jung, Hermann; Reihs, Leonhard; and Roh, Gerhard, 4,401,790, Cl. 525-62.000.
Hoffmann, Gerhard; and Richter, Peter, to BASF Aktiengesellschaft. Multi-layer elements suitable for the production of printing plates and relief plates, and their production. 4,401,749, Cl. 430-271.000.
Hoffmann-La Roche Inc.: *See—*
Fujiwara, Akiko; Hoshino, Tatsuo; and Tazoe, Masaaki, 4,401,812, Cl. 536-6.400.
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Hofmann, Charles F.: *See—*
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Hofmann, Frank, to Walter Hofmann, Firma. Method and devices for making traffic lines or the like. 4,401,265, Cl. 239-1.000.
Hohman, Charles M.: *See—*
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Hojima, Toshinari: *See—*
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Holcombe, Ricardo I.: *See—*
Caballero, Alejandro J.; and Holcombe, Ricardo I., 4,401,638, Cl. 423-340.000.
Hollingsworth GmbH: *See—*
Loffler, Walter, 4,400,852, Cl. 19-106.00R.
Holroyd, Eric: *See—*
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Holzapfel, Bernd H.: *See—*
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Holzen, Donald J.: *See—*
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Homann, Thorsten: *See—*
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Honda, Shoichi, 4,401,067, Cl. 123-193.00P.
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Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, 4,401,180, Cl. 180-148.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,401,080, Cl. 123-440.000.
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, 4,402,050, Cl. 364-460.000.

Honda, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Valve porting for internal combustion engine having oblong cylinder. 4,401,067, Cl. 123-193.00P.

Honeywell Inc.: *See*—
Adams, John T.; and Nelson, Marvin D., 4,401,262, Cl. 236-46.00R.

Hong, Ngai H.: *See*—
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Hongo, Chikara: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,401,820, Cl. 548-344.000.

Hoobler, Mary A.: *See*—
Sikorski, James A.; and Hoobler, Mary A., 4,401,455, Cl. 71-087.000.
Sikorski, James A.; and Hoobler, Mary A., 4,401,604, Cl. 260-968.000.

Hope, Tomasz S., to Northern Telecom Limited. Powder filled fiber optic cable. 4,401,366, Cl. 350-96.230.

Hori, Masayoshi: *See*—
Nomura, Isao; Hori, Masayoshi; Goto, Sotomi; and Kittaka, Hirokazu, 4,401,715, Cl. 428-306.600.

Horino, Akio: *See*—
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Horiuchi, Kunio: *See*—
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Horiuchi, Tomofusa; and Yokota, Shoichiro, to Nissan Motor Co., Ltd. Idling air flow rate adjusting device for an internal combustion engine. 4,401,074, Cl. 123-339.000.

Horiuchi, Yasushi. Ski binding. 4,401,317, Cl. 2ω-625.000.

Hoshi, Yoshikazu: *See*—
Sano, Yukinori; Hoshi, Yoshikazu; and Takahashi, Ikuo, 4,401,076, Cl. 123-357.000.

Hoshino, Tatsuo: *See*—
Fujiwara, Akiko; Hoshino, Tatsuo; and Tazoe, Masaaki, 4,401,812, Cl. 536-6.400.

Hosoda, Yasuo: *See*—
Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.

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Houdan, Jean M.: *See*—
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Howe, Robert K.; and Liu, Kou-Chang, to Monsanto Company. 3'-(Substituted phenyl)-spiro[isobenzofuran-1(3H),5'(4'H)-isoxazol]-3-ones and their use as herbicides. 4,401,457, Cl. 71-88.000.

Howmet Corporation: *See*—
Benn, Raymond C.; Mihalisin, John R.; Curwick, Leroy R.; and Merrick, Howard F., 4,401,622, Cl. 420-449.000.

Hruda, Robert M., to Westinghouse Electric Corp. Hermetically sealed electrical switch with pressure regulating getter means. 4,401,869, Cl. 200-144.00B.

Huber, Paul W., to Multiform Desiccants, Inc. Self-retaining adsorbent bag unit. 4,401,447, Cl. 55-387.000.

Hudson, Bobby D., deceased (Hudson, Bobby J., personal representative), to Hudson, Bobby J. Apparatus for training gin saws and ginning ribs for cotton gins. 4,400,851, Cl. 19-55.00R.

Hudson, Bobby J.: *See*—
Hudson, Bobby D., deceased, 4,400,851, Cl. 19-55.00R.

Hudson, Bobby J., personal representative: *See*—
Hudson, Bobby D., deceased, 4,400,851, Cl. 19-55.00R.

Huggett, Mark D.: *See*—
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Hughes Aircraft Company: *See*—
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Huhman, Michael L.; and James, Larry R., to Allis-Chalmers Corporation. Harvester threshing rotor drive having variable speed belt drive and clutching means. 4,400,930, Cl. 56-11.600.

Hultzsch, Kurt; and Rudolphy, Albert, to Hoechst Aktiengesellschaft. Process for the preparation of a modified hydrocarbon resin. 4,401,791, Cl. 525-132.000.

Hume, James G.; Sidvers, John; and Foster, Harold S., to Xerox Corporation. Universal end of ribbon sensing system. 4,401,394, Cl. 400-208.000.

Hungerford, Gordon P., to Mobil Oil Corporation. Film laminate and product pouch or tube therefrom. 4,401,702, Cl. 428-35.000.

Hurd, Claude C.: *See*—
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Hurley, Thomas J.: *See*—
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Hurst, Paul J.: *See*—
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Husselmann, Hans: *See*—
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Hutschenreuter, Elfriede: *See*—
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Hydro-Quebec: *See*—
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I. C. Moller a/s: *See*—
Kleckers, Bent, 4,401,214, Cl. 206-219.000.

Iannetta, Raymond: *See*—
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Verboom, Pieter, 4,400,895, Cl. 37-58.000.

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Failli, Amedeo; Immer, Hans U.; and Gotz, Manfred K., 4,401,656, Cl. 424-177.000.

Immunex Corporation: *See*—
Gillis, Steven, 4,401,756, Cl. 435-68.000.

Imperial Chemical Industries PLC: *See*—
Cartwright, David; and Collins, David, 4,401,460, Cl. 71-94.000.
Coffee, Ronald A., 4,401,274, Cl. 239-690.000.
Lloyd, Harold; and Coxon, John, 4,401,871, Cl. 200-150.00A.

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Eaton, Gerald E.; and Shtarkman, Emile M., 4,401,298, Cl. 267-140.100.

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INCO Ltd.: *See*—
Ettell, Victor A.; and Babjak, Juraj, 4,401,630, Cl. 423-34.000.
Incorvaia, Anthony J. Sponge splint compression dressing. 4,401,113, Cl. 128-156.000.
Incremona, Joseph H., to Minnesota Mining and Manufacturing Company. Aqueous developable photosensitive composition and printing plate. 4,401,743, Cl. 430-157.000.
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Shirai, Iwao; Momose, Keigo; Sawai, Tadashi; Komatsu, Masakazu; Inoue, Takao; and Wakahata, Tamotsu, 4,401,733, Cl. 429-174.000.
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Wood, Eric, 4,401,696, Cl. 427-236.000.
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Willay, Gerard; and Wittmann, Andre, 4,401,625, Cl. 422-50.000.
Institut Francais du Petrole: *See*—
Gaillard, Jean, 4,401,559, Cl. 208-262.000.
Insulation Systems, Inc.: *See*—
Erlichman, Max, 4,401,218, Cl. 206-446.000.
Intec Corporation: *See*—
Dehuysser, Andre, 4,401,893, Cl. 250-572.000.
Intel Corporation: *See*—
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Frint, William R., 4,401,635, Cl. 423-206.00T.
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Aiken, John A., Jr.; and Shipp, Kenneth O., Jr., 4,402,058, Cl. 364-900.000.
Alexander, Douglas E.; and McCray, Charles M., 4,401,393, Cl. 400-208.000.
Best, John S.; and Sanders, Ian L., 4,402,060, Cl. 365-36.000.
Davy, John C.; Fenton, Brian P.; and Ramage, John G., 4,401,933, Cl. 318-778.000.
Faris, Sadeg M., 4,401,900, Cl. 307-352.000.
Gfeller, Fritz R.; and Mueller, Hans R., 4,402,090, Cl. 455-601.000.
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Kulterman, Robert W.; Rakes, James M.; and Sweat, Robert H., Jr., 4,401,931, Cl. 318-696.000.
Martin, Van C., 4,401,991, Cl. 346-75.000.
McVey, James M.; Romero, Hector G., Jr.; and Wagoner, James D., 4,401,985, Cl. 340-799.000.
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Brander, James E., 4,401,925, Cl. 318-114.000.
International Flavors & Fragrances Inc.: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,401,583, Cl. 252-174.110.
International Harvester Co.: *See*—
Hagarty, Jon R., 4,400,988, Cl. 74-411.500.
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Benn, Raymond C.; Mihalisin, John R.; Curwick, Leroy R.; and Merrick, Howard F., 4,401,622, Cl. 420-449.000.
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Clark, James M., 4,402,041, Cl. 364-200.000.
Fellinger, Frank; and Ruffing, James M., 4,402,079, Cl. 370-84.000.
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Wolde-Tinase, Amde M., 4,400,927, Cl. 52-745.000.
Irbit Holding AG: *See*—
Tschudin-Mahrer, Rolf, 4,401,716, Cl. 428-317.300.
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Koriyama, Masayuki; Ohnishi, Kimimasa; and Ishido, Takao, 4,401,139, Cl. 139-435.000.
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Kashiwabara, Norio; Maruyama, Hirotaka; Ishii, Tetuo; and Kondo, Satoru, 4,401,657, Cl. 424-177.000.
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Islam, Safidul, to Texas Instruments Incorporated. Method of hermetically encapsulating a semiconductor device by laser irradiation. 4,400,870, Cl. 29-588.000.
Isobe, Minoru; and Kikuchi, Hiroshi, to Oki Electric Industry Co., Ltd. Motor with improved temperature characteristics. 4,401,906, Cl. 310-156.000.
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Rieder, Werner, 4,401,803, Cl. 528-176.000.
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Ito, Takeo: *See*—
Kurachi, Hisao; Ito, Takeo; and Onoda, Hiroshi, 4,401,395, Cl. 400-697.100.
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Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.
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Itou, Tomio; and Mizote, Masanori, to Nissan Motor Company, Limited. Method of and apparatus for ensuring correct operation of a microcomputer in the event of power outage. 4,402,057, Cl. 364-900.000.
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Achtstaetter, Gerhard, 4,401,921, Cl. 315-364.000.
Belart, Juan, 4,400,943, Cl. 60-554.000.
Reinartz, Hans-Dieter; and Thiel, Rudolf, 4,400,942, Cl. 60-547.100.
Weiss, Eberhard, 4,401,919, Cl. 315-107.000.
Ives, Milton N.: *See*—
Enright, John A.; Ives, Milton N.; and Daniels, Richard H., 4,401,959, Cl. 335-272.000.
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Aiba, Masahiko; Yamamoto, Yoichi; Iwai, Hiroji; and Umeda, Ikuo, 4,401,990, Cl. 346-75.000.
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Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio control method and apparatus for internal combustion engines. 4,400,944, Cl. 60-605.000.
Iwamura, Eiji; and Motoyama, Keiichi, to Murata Manufacturing Co., Ltd. Cathode-ray tube socket substrate. 4,402,037, Cl. 361-423.000.
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Anderson, Robert M., 4,401,179, Cl. 180-89.140.
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Thumm, Helmut; Bahr, Theodor; and Henrich, Hans, 4,401,277, Cl. 241-38.000.
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Seidenberger, James W., 4,400,903, Cl. 43-122.000.
Ward, Irl E., Jr.; Hallquist, Lisa G.; and Hurley, Thomas J., 4,401,747, Cl. 430-258.000.
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Jackson, Opha L. Radioactive decontamination apparatus and process. 4,401,532, Cl. 204-129.100.
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Jakob, Hans: *See*—
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James, Claude: *See*—
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Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,401,694, Cl. 427-162.000.

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Janner, Karl; and Gregorius, Klaus, to Kraftwerk Union Aktiengesellschaft. Device for irradiating isotope mixtures isotope -selectively. 4,401,627, Cl. 422-186.000.

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Hanyu, Susumu; and Kato, Kenji, 4,401,042, Cl. 112-158.00E.

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Arakawa, Masatoshi; and Nakazawa, Kazuyoshi, 4,401,515, Cl. 203-25.000.

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Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,401,009, Cl. 91-28.000.

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Osborne, Robert L.; Haley, Paul H.; and Jennings, Stephen J., 4,402,054, Cl. 364-554.000.

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Drechsel, Ludwig; and Lasch, Margarete, 4,401,368, Cl. 350-126.000.

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Bresnahan, Roger M.; and Jepson, Paul D., 4,400,841, Cl. 414-564.000.

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Baldwin, Wilbur A.; Silverman, Richard; Jezorek, Leigh; and Pitel, Irving, 4,401,003, Cl. 83-483.000.

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Hayakawa, Nobuo; Ohashi, Yasuo; Ohta, Kenji; Takagi, Yasumasa; and Gotoh, Masami, 4,400,844, Cl. 15-250.160.

Jidosha Kiki Co., Ltd.: *See*—
Minegishi, Sokichi; Takizawa, Tozo; Kawamura, Hideo; and Sagawa, Nobukazu, 4,401,065, Cl. 123-145.00A.
Ohe, Takeshi, 4,400,938, Cl. 60-429.000.

Jin, Sungho, to Bell Telephone Laboratories, Incorporated. Method for making a magnetically anisotropic element. 4,401,483, Cl. 148-120.000.

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Smyth, Harold T., 4,401,773, Cl. 523-116.000.

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Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., 4,401,640, Cl. 423-367.000.

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Johnson, Stanley J.; Allen, David T.; and Baker, Keith R., to Deere & Company. Spout control system. 4,401,403, Cl. 414-335.000.

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Martzloff, Francois D.; and Jones, Marshall G., 4,401,912, Cl. 313-17.000.

Jordan, Robert K. Continuous titanium process. 4,401,467, Cl. 75-66.000.

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Beaumont, Ronald E., 4,401,678, Cl. 426-15.000.

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Joshi, Ashok V., to Rayovac Corporation. Protective active nitrides as additives to nonaqueous cathode materials. 4,401,737, Cl. 429-218.000.

Joshi, Shrinivas G. Electronically variable time delay in piezoelectric media. 4,401,956, Cl. 333-152.000.

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Kaan, Joseph P.: *See*—
Wojtecki, Rudolph G.; and Kaan, Joseph P., 4,401,156, Cl. 165-172.000.

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Tabata, Junichi; and Kaneko, Noboru, 4,401,983, Cl. 340-785.000.
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Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,401,902, Cl. 307-415.000.

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Brand, Gunter; Gerber, Richard; Ehrmann, Karl; Kaufmann, Reinhold; and Kalippke, Harald, 4,401,066, Cl. 123-146.50A.

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Abe, Katsuo; Kobayashi, Shigeru; Kamei, Tsuneaki; Tateishi, Hideki; and Aiuchi, Susumu, 4,401,539, Cl. 204-192.00R.

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Nakane, Hisashi; Kanai, Wataru; and Tsuda, Minoru, 4,401,745, Cl. 430-197.000.

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Kusunoki, Shigeru; Mori, Keijiro; and Kanazawa, Takato, 4,401,884, Cl. 219-492.000.

Kaneda, Isami: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Sakakibara, Susumu; Abe, Ryozo; and Sano, Yasushi, 4,402,070, Cl. 369-43.000.

Kaneko, Noboru: *See*—
Tabata, Junichi; and Kaneko, Noboru, 4,401,983, Cl. 340-785.000.
Tabata, Junichi; and Kaneko, Noboru, 4,401,984, Cl. 340-785.000.

Kaneko, Shoroku; Yamaoka, Sigenori; Mizuno, Masuo; and Okabe, Yukihiro, to Sumitomo Bakelite Company Limited. Crosslinked resin of epoxy compound and isocyanate and process for producing same. 4,401,499, Cl. 156-307.300.

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Uchikune; Tagami, Mutsukazu; Shimizu, Taketo; Yanagisawa, Kiyoshi; Yokosawa, Katsuto; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,401,960, Cl. 335-285.000.

Kansas City Southern Railway Company: *See*—
Spigarelli, Rudolph D.; Aker, John L.; and Berry, Fred M., 4,401,035, Cl. 105-61.000.

Kanthal Corporation, The: *See*—
Watson, Robert A., 4,401,883, Cl. 219-381.000.

Kanzler, Walter; and Schedler, Johannes, to Vereinigte Edelstahlwerke AG (VEW). Method for the recovery of furfural, acetic acid and formic acid. 4,401,514, Cl. 203-15.000.

Kaplan, Milton L.: *See*—
Thompson, H. Lytle; and Kaplan, Milton L., 4,401,561, Cl. 208-212.000.

Karl, Alfons; and Buder, Wolfgang, to Degussa Aktiengesellschaft. Production of organosilicon compounds having azido groups. 4,401,598, Cl. 260-349.000.

Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,401,667, Cl. 424-246.000.

Karlock, James A. Image enhancer apparatus. 4,402,006, Cl. 358-31.000.

Kashiwa, Norio: *See*—
Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, 4,401,589, Cl. 252-429.00B.

Kashiwabara, Norio; Maruyama, Hirotaka; Ishii, Tetuo; and Kondo, Satoru, to Snow Brand Milk Products Co., Ltd. Nutrient composition suitable for enteral feeding. 4,401,657, Cl. 424-177.000.

Kashiwara, Hideaki: *See*—
Kashiwara, Takeaki; Kashiwara, Ryohei; and Kashiwara, Hideaki, 4,401,915, Cl. 313-142.000.

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Kashiwara, Takeaki; Kashiwara, Ryohei; and Kashiwara, Hideaki. Ignition plug for an internal combustion engine. 4,401,915, Cl. 313-142.000.

Kaspar & Esh, Inc.: *See*—
Epstein, Elias, 4,400,932, Cl. 59-82.000.

Kasuya, Katsuhiko; Fujiwara, Mitsuru; Imai, Masaya; Matsunaga, Tetsuzo; and Takahashi, Yasuo, to Hitachi, Ltd. Male and female screw rotor assembly with specific tooth flanks. 4,401,420, Cl. 418-201.000.

Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, to Canon Kabushiki Kaisha. Image forming apparatus incorporating therein ozone filtering mechanism. 4,401,385, Cl. 355-15.000.

Katayama, Nobuaki: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,400,989, Cl. 74-467.000.

Kato, Kenji: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,401,042, Cl. 112-158.00E.

Kato, Kiyoshi; Kondo, Yasuo; Kuwakado, Satosi; and Kakeno, Nobuhiko, to Nippon Soken Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Intake throttling device for diesel engines. 4,401,078, Cl. 123-376.000.

Kato, Motohiko: *See*—
Yamaji, Nobuyuki; and Kato, Motohiko, 4,401,808, Cl. 536-27.000.

Kato, Shohei: *See*—
Matsuzaki, Kenji; Horino, Akio; Terai, Yasuharu; and Kato, Shohei, 4,401,309, Cl. 280-5.00A.

Kato, Toshikazu, to Olympus Optical Company Limited. Cassette holder. 4,402,024, Cl. 360-96.500.

Kato, Yoshito; Matsubara, Hideyuki; and Hashimoto, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of sensing position of movable body and apparatus therefor. 4,401,930, Cl. 318-603.000.

Kato, Yoshito: *See*—
Ohkubo, Hiroyuki; Maru, Hiroshi; Kato, Yoshito; and Hashimoto, Toshio, 4,400,890, Cl. 33-125.00C.

Katsura, Akira: *See*—
Kawai, Jun; and Katsura, Akira, 4,401,391, Cl. 400-120.000.

Kaufmann, Reinhold: *See*—
Brand, Gunter; Gerber, Richard; Ehrmann, Karl; Kaufmann, Reinhold; and Kalippke, Harald, 4,401,066, Cl. 123-146.50A.

Kawabata, Takakazu: *See*—
Miura, Kazuhiko; Kawabata, Takakazu; Hattori, Tadashi; and Ueno, Yoshiki, 4,401,948, Cl. 324-378.000.

Kawabata, Toshiyasu; Tosaka, Hachiro; and Nanya, Toshiki, to Ricoh Company, Ltd. Electrographic development process. 4,401,740, Cl. 430-102.000.

Kawaguchi, Hiroshi; and Nishina, Shuho, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control valve for dual braking system. 4,401,347, Cl. 303-6.00C.

Kawai, Hisasi: *See*—
Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.

Kawai, Jun; and Katsura, Akira, to Matsushita Electric Industrial Co., Ltd. Serial printer. 4,401,391, Cl. 400-120.000.

Kawamata, Motoo: *See*—
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,401,777, Cl. 523-451.000.

Kawamura, Hideo: *See*—
Minegishi, Sokichi; Takizawa, Tozo; Kawamura, Hideo; and Sagawa, Nobukazu, 4,401,065, Cl. 123-145.00A.

Kawana, Takahiro: *See*—
Ozawa, Kazunori; Kawana, Takahiro; Seki, Nakaharu; and Komada, Naoya, 4,401,725, Cl. 428-457.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishikawa, Yoshiyasu, 4,401,410, Cl. 416-186.00R.

Kawate, Kenji: *See*—
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,401,484, Cl. 148-131.000.

Kay Elemetrics Corp.: *See*—
Harbeson, William D., 4,401,850, Cl. 179-1.0SC.

Kazmark, Eugene A. Luggage carrier with pivoting handle. 4,401,319, Cl. 280-655.000.

Kearney & Trecker Corporation: *See*—
Woythal, Robert T.; and Finet, Philip J., 4,400,859, Cl. 29-27.00C.

Keller, Walter: *See*—
Driessen, Manfred; Keller, Walter; and Kutz, Johannes, 4,400,953, Cl. 68-202.000.

Kelley, Douglas M. Yarn tube. 4,401,283, Cl. 242-118.320.

Kelley, Robert B.; Birk, John R.; and Chen, Nai-Yung, to Board of Regents for Education for the State of Rhode Island. Estimating workpiece pose using the feature points method. 4,402,053, Cl. 364-513.000.

Kelsey-Hayes Company: *See*—
Last, Larry L., 4,401,195, Cl. 188-79.50P.

Kemper, Reinhard: *See*—
Lotsch, Wolfgang; Kemper, Reinhard; Bock, Gustav; and Elser, Wolfgang, 4,401,815, Cl. 544-300.000.

Kendall Company, The: *See*—
Taylor, Rebecca S.; and Pavlo, John A., 4,401,125, Cl. 128-715.000.

Kennon, Jerry M.; and Phillips, John S., to Westinghouse Electric Corp. Load management terminal. 4,402,059, Cl. 364-900.000.

Kenyon, Lewis C.: *See*—
Schneider, Alan A.; Flower, Ronald J.; Bowser, George C.; and Kenyon, Lewis C., 4,401,847, Cl. 179-1.00H.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Edelmann, Martin, 4,401,620, Cl. 376-247.000.

Kessler, Jurgen, to Hilti Aktiengesellschaft. Drilling tool. 4,401,172, Cl. 175-283.000.

Kiener, Volker: *See*—
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, 4,401,545, Cl. 204-291.000.

Kienzle Apparate GmbH: *See*—
Vogelhuber, Peter; and Wysk, Hans-Joachim, 4,401,025, Cl. 101-93.050.

Kikkoman Corporation: *See*—
Yamaji, Nobuyuki; and Kato, Motohiko, 4,401,808, Cl. 536-27.000.

Kikuchi, Hiroshi: *See*—
Isobe, Minoru; and Kikuchi, Hiroshi, 4,401,906, Cl. 310-156.000.

Kim, Dong H.; and Bell, Stanley C., to American Home Products Corporation. Process for preparing α-[(alkylamino)methyl]-β-aryloxy-benzeneethanols. 4,401,832, Cl. 564-347.000.

Kim, Dong J. Cassette tape case. 4,401,220, Cl. 206-387.000.

Kimura, Makoto; and Terunuma, Hiroshi, to Nippon Kogaku K.K. Interchangeable finder device. 4,401,374, Cl. 354-25.000.

Kimura, Takeo: *See*—
Ohmura, Kaoru; Koyama, Ryohei; and Kimura, Takeo, 4,401,521, Cl. 204-12.000.
Ohmura, Kaoru; Matsuura, Masaru; Matsui, Takeki; and Kimura, Takeo, 4,401,966, Cl. 338-32.00R.

Kimura, Toshimitsu; and Ohmura, Yutaka, to Nissan Motor Co., Ltd. Bumper construction for automotive vehicles. 4,401,332, Cl. 293-135.000.

Kinder, Carolyn. Panty garments with redirected stress support structure. 4,400,832, Cl. 2-406.000.

Kindig, Alan L.; and Wesseldyk, Albert J., to General Electric Company. Apparatus for use in making electrical interconnections. 4,400,873, Cl. 29-753.000.

King, John F.: *See*—
Unsworth, William; King, John F.; and Bradshaw, Stephen L., 4,401,621, Cl. 420-403.000.

King, Terry S., to Exxon Research & Engineering Co. Process for producing alcohols. 4,401,834, Cl. 568-881.000.

Kinjo, Hisao: *See*—
Wada, Yoshiyo; Kinjo, Hisao; Ozawa, Keiji; Tatsuguchi, Kazuo; Goto, Kunio; and Hirata, Atsumi, 4,402,018, Cl. 358-342.000.

Kinoshita, Minoru; and Sasaki, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Frost detector for refrigerating apparatus. 4,400,949, Cl. 62-140.000.

Kinzbach, Robert B., to Weatherford/Lamb, Inc. Tong assembly. 4,401,000, Cl. 81-57.200.

Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for producing olefin polymers or copolymers. 4,401,589, Cl. 252-429.00B.

Kiovsky, T. E.: *See*—
Graiff, L. B.; and Kiovsky, T. E., 4,401,439, Cl. 44-63.000.

Kirisawa, Tadashi: *See*—
Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, 4,400,974, Cl. 73-118.000.

Kirst, Herbert A., to Eli Lilly and Company. Ester derivatives of 5-O-mycaminosyl tylonolide and method of using same. 4,401,660, Cl. 424-180.000.

Kishi, Norimasa: *See*—
Noso, Kazunori; Yano, Hiroshi; Kishi, Norimasa; and Takeuchi, Yasuhisa, 4,401,852, Cl. 179-1.0VC.

Kishimoto, Juji: *See*—
Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, 4,402,056, Cl. 364-705.000.

Kisler, Semyon, to Polaroid Corporation. Low voltage electrostatic charge regulating apparatus. 4,402,035, Cl. 361-213.000.

Kitamura, Yoichi; Ito, Makoto; and Yurita, Chikara, to Toyo Seikan Kaisha Ltd. Method of welding tin-free steel can. 4,401,874, Cl. 219-64.000.

Kitani, Hiroaki: *See—*
Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, 4,401,589, Cl. 252-429.00B.

Kitazume, Yoshiaki: *See—*
Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Ohira, Eiji, 4,401,849, Cl. 179-1.0SC.

Kittaka, Hirokazu: *See—*
Nomura, Isao; Hori, Masayoshi; Goto, Sotomi; and Kittaka, Hirokazu, 4,401,715, Cl. 428-306.600.

Klaiber, William C. Method for cleaning paint rollers. 4,401,476, Cl. 134-33.000.

Klar, Erhard: *See—*
Moskowitz, Larry N.; and Klar, Erhard, 4,401,724, Cl. 428-564.000.

Klaren, Dick G., to Esmil BV. Heat exchanger having a plurality of vertical pipes for upward passage of a first heat-exchanging medium. 4,401,152, Cl. 165-104.160.

Klassen, Horst W., to Lucas Industries Limited. Pin guide for sliding caliper disc brakes. 4,401,194, Cl. 188-73.440.

Klaxon, S.A.: *See—*
Bevillard, Jean G., 4,401,049, Cl. 116-142.0FP.

Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, to United States of America, Army. Method for treating gonorrhea infections with 2-acetyl- and 2-propionylpyridine thiosemicarbazones. 4,401,670, Cl. 424-250.000.

Kleber, Rolf: *See—*
Engelhardt, Friedrich; and Kleber, Rolf, 4,401,836, Cl. 525-61.000.

Kleckers, Bent, to I. C. Moller a/s. Dual component mixing package. 4,401,214, Cl. 206-219.000.

Kleiner, Hans-Jerg; Knittel, Volker; and Debus, Gerhard, to Hoechst Aktiengesellschaft. Use of dimethylphosphinylalkanephosphonic acid as a setting retarder in gypsum. 4,401,473, Cl. 106-109.000.

Klenk, Ludwig: *See—*
Porrmann, Herbert; Siefried, Walter; Klenk, Ludwig; and Stenger, Karl, 4,401,136, Cl. 138-118.100.

Klimek, Boleslaw M.: *See—*
Dvorachek, Harold A.; and Klimek, Boleslaw M., 4,401,357, Cl. 339-272.00R.

Klimstra, Jacob, to N.V. Nederlandse Gasunie. Piston position detector having a metal cylinder rotating about an eccentric axis. 4,401,946, Cl. 324-208.000.

Klockner-Humboldt-Deutz AG: *See—*
Epper, Wolfgang; Michalski, Lothar; and Schonteich, Peter, 4,401,564, Cl. 210-150.000.
Koslowski, Karl, 4,401,429, Cl. 494-30.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Oberlander, Georg, 4,400,934, Cl. 60-39.070.

Knabben, Heinrich. Heating device comprising a heat pump. 4,400,950, Cl. 62-238.600.

Knight, Stanley P.; and Henderson, John G. N., to RCA Corporation. Television tuning system with electronic frequency adjustment apparatus. 4,402,089, Cl. 455-186.000.

Knight, Wesley W., to General Electric Company. Two-dimensional digital linear interpolation system. 4,402,012, Cl. 358-160.000.

Knittel, Volker: *See—*
Kleiner, Hans-Jerg; Knittel, Volker; and Debus, Gerhard, 4,401,473, Cl. 106-109.000.

Knothe, Erich; Melcher, Franz-Josef; Ober, Jurgen; Sodler, Walter; and Martens, Veronika, to Sartorius GmbH. Electronic weigher with a weighing scale located above the weigher casing. 4,401,176, Cl. 177-180.000.

Knuth, Manfred: *See—*
Suhr, Gunther; Knuth, Manfred; Malchow, Wilhelm; and Homann, Thorsten, 4,401,023, Cl. 100-148.000.

Knutson, Darryl C., to Toystalgia, Incorporated. Coin bank. 4,401,259, Cl. 232-4.00R.

Knutson, Richard A. Wound-healing compositions containing povidone-iodine. 4,401,651, Cl. 424-80.000.

Kobayashi, Kazuhiko, to Fuji Photo Film Co., Ltd.; and Mitomo Co., Ltd. Joining apparatus. 4,401,504, Cl. 156-505.000.

Kobayashi, Masami. Apparatus for electroplating a strip of metal of relatively low electric conductivity. 4,401,541, Cl. 204-206.000.

Kobayashi, Mitsunori; and Doi, Yoshihiko, to Sumitomo Electric Industries, Ltd. Highly hard material coated articles. 4,401,719, Cl. 428-457.000.

Kobayashi, Shigeru: *See—*
Abe, Katsuo; Kobayashi, Shigeru; Kamei, Tsuneaki; Tateishi, Hideki; and Aiuchi, Susumu, 4,401,539, Cl. 204-192.00R.

Kobayashi, Teruaki: *See—*
Tokinage, Daizo; Kobayashi, Teruaki; Yuasa, Mitsuyoshi; Itoh, Michio; and Yasuda, Kazuo, 4,401,387, Cl. 356-341.000.

Kobayashi, Tetuo; and Hirai, Syoichi, to Nippon Cable System, Inc. Mechanism for absorbing elongation of a wire. 4,400,993, Cl. 74-501.50R.

Kobe Steel, Ltd.: *See—*
Amano, Itaru; and Fujieda, Yasuhiko, 4,401,422, Cl. 425-38.000.

Kobler, Ingo; and Burger, Rainer, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Printing machine web guiding arrangement. 4,401,028, Cl. 101-178.000.

Koch, Richard C. Media storage device. 4,401,216, Cl. 206-387.000.

Koelfgen, Douglas. Oil filter cartridge for motorcycles. 4,401,563, Cl. 210-130.000.

Kofahl, William M., to Flying K Equipment System, Inc. Jet engine pump and downhole heater. 4,401,159, Cl. 166-59.000.

Koga, Nobuhito: *See—*
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,401,777, Cl. 523-451.000.

Kohout, Jaroslav: *See—*
Gross, Pavel; and Kohout, Jaroslav, 4,400,977, Cl. 73-432.00R.

Koike, Mitsuhito; and Satoh, Atsushi, to Silver Seiko Ltd. Stitch transfer device for a knitting machine. 4,400,952, Cl. 66-60.00H.

Koishi, Masafumi: *See—*
Senga, Takao; Koishi, Masafumi; and Tsubai, Yasuo, 4,401,739, Cl. 430-16.000.

Koitabashi, Takeo: *See—*
Suzuki, Akio; Shiozawa, Hiroaki; Koitabashi, Takeo; and Takiguchi, Hideki, 4,401,754, Cl. 430-599.000.

Kokusai Denshi Denwa Kabushiki Kaisha: *See—*
Mochizuki, Kiyofumi, 4,401,364, Cl. 350-96.160.

Koliwad, Krishna M.: *See—*
Liu, James K.; Schwuttke, Guenter H.; and Koliwad, Krishna M., 4,401,505, Cl. 156-608.000.

Komada, Naoya: *See—*
Ozawa, Kazunori; Kawana, Takahiro; Seki, Nakaharu; and Komada, Naoya, 4,401,725, Cl. 428-457.000.

Komatsu, Masakazu: *See—*
Shirai, Iwao; Momose, Keigo; Sawai, Tadashi; Komatsu, Masakazu; Inoue, Takao; and Wakahata, Tamotsu, 4,401,733, Cl. 429-174.000.

Komossa, Werner; and Ramsch, Gerhard, to Hauni-Werke Korber & Co. KG. Apparatus for supplying particles of tobacco to the comminuting station of a shredding machine. 4,401,205, Cl. 198-524.000.

Komoto, Akira. Electronic balance with load placement deviation correction. 4,401,173, Cl. 177-25.000.

Komuro, Katsusuke: *See—*
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, 4,402,050, Cl. 364-460.000.

Kondo, Hideo: *See—*
Watabe, Tomiji; Kondo, Hideo; Okuda, Kyokai; Yano, Kenji; and Asano, Seiichi, 4,400,940, Cl. 60-502.000.

Kondo, Kazuyoshi; and Nakamura, Yoshiaki, to Kabushiki Kaisha Wako. Method and device for continuous production of flanged hollow article. 4,400,964, Cl. 72-265.000.

Kondo, Nobuo: *See—*
Tsuchida, Takashi; Okada, Kazukiyo; Okuda, Yutaka; Kondo, Nobuo; and Shinohara, Toshio, 4,402,048, Cl. 364-442.000.

Kondo, Satoru: *See—*
Kashiwabara, Norio; Maruyama, Hirotaka; Ishii, Tetuo; and Kondo, Satoru, 4,401,657, Cl. 424-177.000.

Kondo, Takashi: *See—*
Nitta, Tsuneo; Murata, Toshitake; Tsuboi, Hiroyuki; and Kondo, Takashi, 4,401,851, Cl. 179-1.0SD.

Kondo, Yasuo: *See—*
Kato, Kiyoshi; Kondo, Yasuo; Kuwakado, Satosi; and Kakeno, Nobuhiko, 4,401,078, Cl. 123-376.000.

Kongshaug, Gunnar, to Norsk Hydro a.s. Steam cleaning system for process equipment and compressors. 4,400,891, Cl. 34-85.000.

Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Koudstaal, Willem; and Organ, William J., 4,400,910, Cl. 47-84.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Abe, Tadashi, 4,401,384, Cl. 355-11.000.
Minejima, Teruo; and Sakurai, Isao, 4,401,382, Cl. 355-3.0SH.
Suzuki, Akio; Shiozawa, Hiroaki; Koitabashi, Takeo; and Takiguchi, Hideki, 4,401,754, Cl. 430-599.000.

Koontz, Ernest T., Jr., to Armstrong World Industries, Inc. Veneer salvage technique. 4,401,496, Cl. 156-182.000.

Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., to Shell Oil Company. Thermosetting resinous binder compositions, their preparation, and use as coating materials. 4,401,774, Cl. 523-402.000.

Koppers Company, Inc.: *See—*
Cain, George R., 4,401,568, Cl. 210-515.000.

Korb, Donald R.: *See—*
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,401,372, Cl. 351-160.00H.

Korbell, George K., to Sheller-Globe Corporation. Alternator having stator carrying both field and armature windings. 4,401,939, Cl. 322-59.000.

Korf Technologies, Inc.: *See—*
Wells, William; and Nose, Dalton, 4,401,466, Cl. 75-60.000.

Koriyama, Masayuki; Ohnishi, Kimimasa; and Ishido, Takao, to Nissan Motor Co., Ltd. Weft picking device of air jet loom. 4,401,139, Cl. 139-435.000.

Korostenski, Milan, to ASEA Aktiebolag. Treatment of organic ion exchange material containing radioactive waste products. 4,401,591, Cl. 252-629.000.

Koshugi, Junichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Shaped material comprising acylated product of mixture of chitin derivatives. 4,401,807, Cl. 536-20.000.

Koslowski, Karl, to Klockner-Humboldt-Deutz AG. Self-emptying solid bowl centrifuge. 4,401,429, Cl. 494-30.000.

Kostlin, Heiner: *See—*
Frank, Gunter; Kostlin, Heiner; Sprengers, Leo M.; and Campbell, Ronald J., 4,401,693, Cl. 427-160.000.

Kotian, Vijayraj M., to Eaton Corporation. Flame retardant elastomeric compositions and articles using same. 4,401,783, Cl. 524-371.000.

Koudstaal, Willem; and Organ, William J., to Koninklijke Emballage Industrie Van Leer B.V. Method for protecting plants during transportation by packaging and article. 4,400,910, Cl. 47-84.000.

Koyama, Mashiro: *See—*
Aoyagi, Akira; Sakata, Kazuomi; Ikeda, Shinichi; and Koyama, Mashiro, 4,400,981, Cl. 73-862.510.
Koyama, Ryohei: *See—*
Ohmura, Kaoru; Koyama, Ryohei; and Kimura, Takeo, 4,401,521, Cl. 204-12.000.
Koza, Francis R.; and Parrott, Richard A., to GTE Products Corporation. Discharge lamp with mount providing self centering and thermal expansion compensation. 4,401,913, Cl. 313-25.000.
Kraeling, John B., Jr. Automatic cargo hook. 4,401,334, Cl. 294-83.00R.
Kraftwerk Union Aktiengesellschaft: *See—*
Janner, Karl; and Gregorius, Klaus, 4,401,627, Cl. 422-186.000.
Krajewski, Zdzislaw A. A., to Bayly Engineering Limited. Two wire F.D. multiplex system. 4,402,076, Cl. 370-30.000.
Kramer, Lee F.: *See—*
Christensen, Robert B.; and Kramer, Lee F., 4,400,898, Cl. 37-118.00A.
Kramer, Remi T. Protective brush holder. 4,401,215, Cl. 206-362.300.
Krantz, Emerson H.; and Peebles, Russell H., to Chrysler Corporation. Counterbalance pinion for vehicle window regulator. 4,400,913, Cl. 49-352.000.
Krass, Dennis K., to PPG Industries, Inc. 4-Trifluoromethylphenoxybenzaldoximes. 4,401,602, Cl. 260-465.00E.
Kratzer, Terry L., to Acheson Industries, Inc. Water-based metal forming lubricant composition and process. 4,401,579, Cl. 252-17.000.
Kraus, James H., to Excelermatic Inc. Infinitely variable traction roller transmission. 4,400,987, Cl. 74-200.000.
Krieg, Donald J., to Mobil Oil Corporation. Laminar thermoplastic films, bags thereof. 4,401,256, Cl. 229-53.000.
Krohn, Kenneth A.; Vera, David R.; and Stadalnik, Robert C., to University of CA, The Regents of the. Radiolabeled neoglycopeptides. 4,401,647, Cl. 424-1.500.
Krol, Thijs, to U.S. Philips Corporation. Multi-processor computer system. 4,402,045, Cl. 364-200.000.
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Herman, Daniel F.; and Kruse, Uno, 4,401,795, Cl. 525-327.800.
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Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.
Kulikowski, Patricia A.; Palmbos, Allen L.; and Tyke, Charles R., to Westinghouse Electric Corp. Support rail. 4,401,222, Cl. 211-94.000.
Kulterman, Robert W.; Rakes, James M.; and Sweat, Robert H., Jr., to International Business Machines Corporation. Apparatus actuated by a pair of stepper motors with shared drive. 4,401,931, Cl. 318-696.000.
Kulwicki, Bernard M.: *See—*
Shukla, Vishwa N.; and Kulwicki, Bernard M., 4,401,879, Cl. 219-206.000.
Kumai, Teruo: *See—*
Ito, Sumio; Kumai, Teruo; Oki, Hisashi; and Tanahashi, Toshio, 4,401,072, Cl. 123-292.000.
Kunczynski, Jan K. Friction-based, motion damping assembly for a chairlift or the like. 4,401,198, Cl. 188-379.000.
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Hagiwara, Hiroshi; and Iwasaki, Takao, 4,401,806, Cl. 528-498.000.
Koshugi, Junichi, 4,401,807, Cl. 536-20.000.
Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, 4,401,592, Cl. 260-112.00B.
Kurland, Kenneth Z. Means and method of implanting bioprosthetics. 4,400,833, Cl. 3-1.000.
Kuroiwa, Hiroshi: *See—*
Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, 4,400,974, Cl. 73-118.000.
Kuroyanagi, Makoto: *See—*
Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.
Kussmaul, Ulrich: *See—*
Ferchland, Dieter; Kussmaul, Ulrich; Langer, Manfred; and Muller, Rolf, 4,401,603, Cl. 260-543.200.
Kusunoki, Shigeru; Mori, Keijiro; and Kanazawa, Takato, to Matsushita Electric Industrial Co., Ltd. Method of controlling heating in food heating apparatus including infrared detecting system. 4,401,884, Cl. 219-492.000.
Kutz, Johannes: *See—*
Driessen, Manfred; Keller, Walter; and Kutz, Johannes, 4,400,953, Cl. 68-202.000.
Kuwahara, Hiroshi: *See—*
Kamata, Yasuji; Kuwahara, Hiroshi; Ide, Jushi; Yamashita, Kenkichi; and Takahashi, Koji, 4,401,922, Cl. 315-368.000.
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Kato, Kiyoshi; Kondo, Yasuo; Kuwakado, Satosi; and Kakeno, Nobuhiko, 4,401,078, Cl. 123-376.000.
Kuzdrall, James A. Thermal gain sensor. 4,401,104, Cl. 126-419.000.
Kverneland A/S: *See—*
Skjaeveland, Magne, 4,400,994, Cl. 74-520.000.
Kwiatkowski, George T.: *See—*
Lundell, Edwin O.; and Kwiatkowski, George T., 4,401,536, Cl. 204-159.200.
Kyle, James C., to Kyle, James C. Ceramic seal between spaced members such as a terminal pin and a ferrule. 4,401,766, Cl. 501-15.000.
Kyoto Ceramic Co., Ltd.: *See—*
Minegishi, Sokichi; Takizawa, Tozo; Kawamura, Hideo; and Sagawa, Nobukazu, 4,401,065, Cl. 123-145.00A.
L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques: *See—*
Fleuret, Daniel, 4,401,844, Cl. 174-72.00B.
LaBudde, Edward V.: *See—*
Hazel, Robert L.; and LaBudde, Edward V., 4,402,061, Cl. 365-127.000.
La Clair, Louis M., to Union Carbide Corporation. Air separation process for the production of krypton and xenon. 4,401,448, Cl. 62-22.000.
La Grouw, Johannes: *See—*
Van Loghem, Johannes J.; and La Grouw, Johannes, 4,400,925, Cl. 52-471.000.
LaHann, Thomas R.: *See—*
Buckwalter, Brian L.; and LaHann, Thomas R., 4,401,663, Cl. 424-321.000.
L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude: *See—*
Monnier, Jean-Pierre, 4,401,115, Cl. 128-204.230.
Langer, Manfred: *See—*
Ferchland, Dieter; Kussmaul, Ulrich; Langer, Manfred; and Muller, Rolf, 4,401,603, Cl. 260-543.200.
Lankston, Robert J., to Gulf & Western Manufacturing Company. Device for launching spherical pigs into a pipeline. 4,401,133, Cl. 137-268.000.
Larker, Hans, to ASEA Aktiebolag. Composite material. 4,401,728, Cl. 428-614.000.
Larson, Herbert J.: *See—*
Anders, Gene A.; Larson, Herbert J.; and Miller, Charles R., 4,401,154, Cl. 165-151.000.
Lasch, Margarete: *See—*
Drechsel, Ludwig; and Lasch, Margarete, 4,401,368, Cl. 350-126.000.
Last, Larry L., to Kelsey-Hayes Company. Automatic brake adjuster. 4,401,195, Cl. 188-79.50P.
Lau, Philip T. S., to Eastman Kodak Company. Aryloxy substituted photographic couplers and photographic elements and processes employing same. 4,401,752, Cl. 430-385.000.
Laurel Bank Machine Co., Ltd.: *See—*
Watanabe, Kenkichi, 4,400,928, Cl. 53-64.000.
Laws, Gerald E.: *See—*
Guttag, Karl M.; McDonough, Kevin C.; and Laws, Gerald E., 4,402,043, Cl. 364-200.000.
Lawson, Robert M., to GCA Corporation. Apparatus for cleaning semiconductor wafers. 4,401,131, Cl. 134-149.000.
Leblanc, Jean, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,401,082, Cl. 123-447.000.
Leblanc, Jean, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,401,083, Cl. 123-449.000.
Lechner, Uwe: *See—*
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,401,667, Cl. 424-246.000.
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, to Societe Vetrotex Saint-Gobain. Process and apparatus for the manufacture of discontinuous glass fibers. 4,401,451, Cl. 65-1.000.
Lederer, Edgar: *See—*
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, 4,401,659, Cl. 424-177.000.
Lee, Fu-Ming, to Phillips Petroleum Company. Vapor-liquid extractive distillation with dialkyl sulfone/water combination. 4,401,517, Cl. 203-53.000.
Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Polycrystalline silicon-bonded cubic boron nitride body and method. 4,401,443, Cl. 51-307.000.
Leflar, Charles C.: *See—*
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A., 4,401,765, Cl. 436-533.000.
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, to Agence National de Valorisation de la Recherche (ANVAR). Muramyl-peptides fixed to peptide-polymers and pharmaceutical compositions containing them. 4,401,659, Cl. 424-177.000.
Leger' Equipment Corp.: *See—*
Morin, George A., 4,401,300, Cl. 270-55.000.
Leisure Products, Inc.: *See—*
Moeser, Denis S., 4,401,287, Cl. 248-425.000.
Lemmer, Helmut; and Breidenbach, Kurt, to Starkstrom Gummersbach GmbH. Contact device for low voltage switch devices. 4,401,863, Cl. 200-16.00A.
Leonov, Alexandr Y.; Matveev, Georgy G.; Morozov, Leonid V.; and Bobovsky, Vladimir A. Apparatus for thermochemical treatment of crushed straw and or dry fodder mixtures. 4,401,019, Cl. 99-471.000.

Leopold, Kurt E.: *See—*
Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, 4,401,920, Cl. 315-150.000.

Lepert, Philippe R., to Syminex [Societe Anonyme]. Method and device for detecting changes in the mechanical state of the members of a structure implanted in the sea. 4,400,980, Cl. 73-579.000.

Lerner, Bernard, to Automated Packaging Systems, Inc. Container strip having inserts. 4,401,213, Cl. 206-205.000.

Leroux, Patrick: *See—*
Cordier, Georges; and Leroux, Patrick, 4,401,819, Cl. 546-252.000.

Les Fils d'Auguste Scheuchzer S.A.: *See—*
Scheuchzer, Fredy; and Buhler, Fritz, 4,400,897, Cl. 37-104.000.

Lescovich, Joseph E.: *See—*
Salina, Louis E.; and Lescovich, Joseph E., 4,401,412, Cl. 417-12.000.

Lesniewski, Joseph M.: *See—*
Barda, Henry J.; and Lesniewski, Joseph M., 4,401,778, Cl. 524-89.000.

le Vesconte, Ivor J. R.: *See—*
Hartshorn, Frank; le Vesconte, Ivor J. R.; Murphy, Brian J. M.; and Storer, Richard E., 4,400,839, Cl. 12-12.500.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Sulfamoyl chlorides. 4,401,816, Cl. 544-320.000.

Lewiner, Jacques; Dreyfus, Gerard; and Perino, Didier. Electret devices for measuring ionizing radiation. 4,401,891, Cl. 250-374.000.

Lewis, Eugene R. Foam/foil backer for siding and siding assembly and method for making same. 4,400,918, Cl. 52-98.000.

Lewis, Henry G., Jr., to RCA Corporation. Clock generator for a digital color television signal receiver. 4,402,005, Cl. 358-28.000.

Lewis, Jeffrey J. Wind instrument. 4,401,007, Cl. 84-380.00R.

Lewis, Robert J., to Phillips Petroleum Company. Spray device useful in carbon black reactor. 4,401,626, Cl. 422-151.000.

Lewis, Thomas H.: *See—*
Tatum, Joe F.; and Lewis, Thomas H., 4,401,540, Cl. 204-196.000.

Libbey-Owens-Ford Company: *See—*
Bresnahan, Roger M.; and Jepson, Paul D., 4,400,841, Cl. 414-564.000.

Liberti, Frank N.: *See—*
Axelrod, Robert J.; Liberti, Frank N.; and Semen, John, 4,401,792, Cl. 525-175.000.

Licencia Talalmanyokat Ertekesito Vallalat: *See—*
Ziegler, Janos, 4,401,015, Cl. 99-373.000.

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Rathjens, Dieter; and Schone, Gerhard, 4,402,009, Cl. 358-125.000.

Ligorati, Ferdinando: *See—*
Canavesi, Roberto; Ligorati, Ferdinando; Ghezzi, Roberto; and Clemente, Roberto, 4,401,631, Cl. 423-54.000.

Likins, Merle R., Jr., to Phillips Petroleum Company. Batch distillation. 4,401,512, Cl. 196-132.000.

Lin, Teng-Fang: *See—*
Anderson, Tyrone D.; and Lin, Teng-Fang, 4,401,303, Cl. 272-76.000.

Lindahl, Richard W.: *See—*
Fabel, George W.; and Lindahl, Richard W., 4,402,000, Cl. 346-155.000.

Linde Aktiengesellschaft: *See—*
Moranduzzo, Giampaolo; Abels, Theodor; and Stuhr, Hans-Waldemar, 4,400,939, Cl. 60-431.000.
Schramm, Walter, 4,401,450, Cl. 62-13.000.

Linossi, Valentino, to Zinken Italiana S.p.A. Combination planing, sawing, milling and mortising apparatus. 4,401,142, Cl. 144-1.00R.

Littleford, Philip O. Stable electrodes for endocardial pacing. 4,401,127, Cl. 128-786.000.

Liu, James K.; Schwuttke, Guenter H.; and Koliwad, Krishna M., to United States of America, Administrator National Aeronautics and Space Administration. Method of increasing minority carrier lifetime in silicon web or the like. 4,401,505, Cl. 156-608.000.

Liu, Kou-Chang: *See—*
Howe, Robert K.; and Liu, Kou-Chang, 4,401,457, Cl. 71-88.000.

Liu, Ping Y.; and Miller, Kenneth F., to General Electric Company. Polyolefin-poly(ester-carbonate) composition. 4,401,785, Cl. 524-508.000.

Lloyd, Harold; and Coxon, John, to Imperial Chemical Industries PLC. Halogenated hydrocarbon compositions and electrical apparatus containing such compositions. 4,401,871, Cl. 200-150.00A.

Lloyd, Raymond A.; Charles, Larry L.; Susie, William F.; Tate, Allen W., Jr.; and Reeder, James R., to Westinghouse Electric Corp. Automatic test system utilizing interchangeable test devices. 4,402,055, Cl. 364-579.000.

Lobmeyer, Raymond J.; and Miller, James A., to Deere & Company. Control for quickly effecting displacement changes in a pump supplying fluid to primary and secondary function control valves. 4,400,937, Cl. 60-422.000.

Lockheed Corporation: *See—*
Cronin, Michael J., 4,401,938, Cl. 322-29.000.

Lockwood, Arthur H., to Hughes Aircraft Company. Liquid phase epitaxy of mercury cadmium telluride layer. 4,401,487, Cl. 148-171.000.

Loeb, Marvin P.: *See—*
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,401,534, Cl. 264-138.000.

Loewy Robertson Engineering Co. Ltd.: *See—*
Benoy, David C., 4,401,865, Cl. 200-61.130.

Loffler, Walter, to Hollingsworth GmbH. Dirt separator with a web-carding plate. 4,400,852, Cl. 19-106.00R.

Logsdon, Duane D. Apparatus for securing pipe. 4,400,920, Cl. 52-221.000.

Londres, Manuel P., to Allis-Chalmers Corporation. Cable retainer clip. 4,400,992, Cl. 74-501.00R.

Looney, Catharine E.: *See—*
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A., 4,401,765, Cl. 436-533.000.

Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, to Choay, S.A. Oligosaccharides having anti-Xa activity and pharmaceutical compositions containing them. 4,401,662, Cl. 424-183.000.

Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, to Choay S.A. Process for making oligosaccharides having anti-Xa activity and the resulting oligosaccharides. 4,401,758, Cl. 435-84.000.

Lotsch, Wolfgang; Kemper, Reinhard; Bock, Gustav; and Elser, Wolfgang, to BASF Aktiengesellschaft. Isoindoline colorants. 4,401,815, Cl. 544-300.000.

Louis, Joseph E., to Sundstrand Corporation. Engine speed control. 4,400,935, Cl. 60-431.000.

Lowell, Jack L.; Nevins, Michael J.; Reid, Kenneth I. G.; and Walter, Kenneth L., to NL Industries, Inc. Process for preparing alkali metal salt of carboxymethyl cellulose. 4,401,813, Cl. 536-98.000.

Lowrey, Robert D.: *See—*
Chern, Mao-Jin; and Lowrey, Robert D., 4,401,537, Cl. 204-159.110.

Lucas Industries Limited: *See—*
Farr, Glyn P. R., 4,401,348, Cl. 303-116.000.
Jarrett, Boaz A.; and Mowbray, Dorian F., 4,401,084, Cl. 123-450.000.
Klassen, Horst W., 4,401,194, Cl. 188-73.440.

Luddy, Michael A.: *See—*
Craig, Alan R.; Frey, William A.; Leflar, Charles C.; Looney, Catharine E.; and Luddy, Michael A., 4,401,765, Cl. 436-533.000.

Luebke, Randall A.: *See—*
Salmond, Andrea; St. John, Patricia; Luebke, Randall A.; and Van Tassel, Jeffrey B., 4,401,209, Cl. 206-5.000.

Luigi Stoppani S.p.A.: *See—*
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, 4,401,573, Cl. 210-724.000.

Lunde, Martin R. Wood-fired boiler and storage system. 4,401,101, Cl. 126-367.000.

Lundell, Edwin O.; and Kwiatkowski, George T., to Delmed, Inc. Biocompatible, steam-sterilizable irradiated articles comprised of ethylene copolymer and polypropylene blends. 4,401,536, Cl. 204-159.200.

Lunn, William H. W., to Eli Lilly and Company. Pyrazinium substituted cephalosporins. 4,401,668, Cl. 424-246.000.

Lupoli, Peter J., to Sun Chemical Corporation. Stop-light monitor device. 4,401,972, Cl. 340-80.000.

Luque, Fortino C. Comb and cut baton. 4,401,129, Cl. 132-45.00R.

Luther, Ronald B. Apparatus for advancing oversized catheter through cannula, and the like. 4,401,433, Cl. 604-159.000.

Lwoff, Andre; Yerushalmi, Aharon; Cohen, Irun R.; and Moshe, Gideon B., to Yeda Research & Development Co., Ltd. Apparatus for heating of the nasal passages. 4,401,114, Cl. 128-200.140.

Lyle, John M.: *See—*
Fisher, Robert J.; Jaworowicz, Arthur C.; Lyle, John M.; Sellers, Jerry W.; and Steed, Gary R., 4,401,289, Cl. 248-483.000.

Lyons, Dale E.: *See—*
Swanson, David L.; and Lyons, Dale E., 4,400,986, Cl. 74-128.000.

Lysholm, Donna L.: *See—*
Pellet, Regis J.; Bertolacini, Ralph J.; and Lysholm, Donna L., 4,401,558, Cl. 208-139.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Paskarbeit, Edgar; and Scholer, Horst D., 4,402,083, Cl. 373-79.000.
Zurner, Hans-Jurgen; Emmerling, Wolfram; and Steimer, Werner, 4,401,071, Cl. 123-276.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Kobler, Ingo; and Burger, Rainer, 4,401,028, Cl. 101-178.000.

MaaB, Hans: *See—*
Eckold, Gerd-Jurgen; and MaaB, Hans, 4,400,966, Cl. 72-392.000.

Maag Gear-Wheel & Machine Company Limited: *See—*
Bloch, Peter; and Bickel, Hansjorg, 4,400,916, Cl. 51-287.000.

MacDonell, Gary D.; and Stacy, Carl J., to Phillips Petroleum Company. Photochemical method of preparing dihydrocarbyl mercaptohydrocarbyl phosphonates as silica-to-rubber coupling agents. 4,401,535, Cl. 204-158.00R.

Madsen, Brent W.; Dolezal, Henry; Bloom, Philip A.; and Shirts, Monte B., to United States of America, Interior. Recovery of arsenic from flue dust. 4,401,632, Cl. 423-87.000.

Maeda, Haruo, to Olympus Optical Co., Ltd. $f-\theta$ Lens system. 4,401,362, Cl. 350-6.800.

Maeda, Yoshiyasu, to Murata Kikai Kabushiki Kaisha. Belt-type false twisting unit. 4,400,931, Cl. 57-336.000.

Maekawa, Kouzi: *See—*
Miyakawa, Nobuhiro; and Maekawa, Kouzi, 4,401,741, Cl. 430-110.000.

Magariyama, Kenichi: *See—*
Sato, Akihiko; and Magariyama, Kenichi, 4,401,377, Cl. 354-173.000.

Magdo, Ingrid E.: *See—*
Goth, George R.; Magdo, Ingrid E.; and Malaviya, Shashi D., 4,400,865, Cl. 29-571.000.

Magnesium Elektron Limited: *See—*
Unsworth, William; King, John F.; and Bradshaw, Stephen L., 4,401,621, Cl. 420-403.000.

Magnusson, Stig: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,402,077, Cl. 370-63.000.

Maier, Roland: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,401,667, Cl. 424-246.000.

Maio, Patrick S.: *See*—
Conroy, Betty A.; Brown, William M.; and Maio, Patrick S., 4,401,255, Cl. 229-37.00R.

Majewski, Stanley J., to St. Charles Manufacturing Co. Start/stop control system for conveyor means. 4,401,189, Cl. 186-68.000.

Makishima, Tokuo: *See*—
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,401,799, Cl. 526-142.000.

Malaviya, Shashi D.: *See*—
Goth, George R.; Magdo, Ingrid E.; and Malaviya, Shashi D., 4,400,865, Cl. 29-571.000.

Malchow, Wilhelm: *See*—
Suhr, Gunther; Knuth, Manfred; Malchow, Wilhelm; and Homann, Thorsten, 4,401,023, Cl. 100-148.000.

Malwitz, Nelson, to Sealed Air Corporation. Foam, composition and method useful for retrofit insulation. 4,401,769, Cl. 521-113.000.

Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., to Syntex (U.S.A.) Inc. Contact lens. 4,401,372, Cl. 351-160.00H.

Manera, Maxime: *See*—
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,401,451, Cl. 65-1.000.

Manfre, Robert J.: *See*—
Arthen, Frank J., Jr.; and Manfre, Robert J., 4,401,585, Cl. 252-188.3CL.

Mangood Corporation: *See*—
Caldicott, Jack R., 4,401,175, Cl. 177-163.000.

Manis, Jack J.; and Highlander, Sarah K., to Upjohn Company, The. Process for stabilizing plasmids by deletion of DNA. 4,401,761, Cl. 435-172.000.

Mannesmann Aktiengesellschaft: *See*—
Diederich, Gerd; Solmecke, Rolf; Husselmann, Hans; Heimann, Eberhard; and Schauffele, Frithjof, 4,401,243, Cl. 222-591.000.

Mannesmann DeMag AG: *See*—
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Mansolillo, Robert D.; and Kaminski, Stanley J., to Congoleum Corporation. Embossing of foamable plastisols on dry blend layers. 4,401,611, Cl. 264-46.400.

Marchadour, Jean-Charles. Devices used for filling containers. 4,401,238, Cl. 222-80.000.

Marcus, Arnold D.: *See*—
Sheinaus, Harold; and Marcus, Arnold D., 4,401,665, Cl. 424-233.000.

Margetts, Peter K.: *See*—
Dietz, Raymond L.; Featherby, Michael; and Margetts, Peter K., 4,401,767, Cl. 501-19.000.

Marin-Pache, Reynald: *See*—
Boichot-Castagne, Bernard; Case, Roger; and Marin-Pache, Reynald, 4,401,872, Cl. 200-153.00G.

Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Crystalline isotactic zeolites and their preparation. 4,401,637, Cl. 423-329.000.

Marsch, Hans-Dieter; and Briecke, Hans-Gunther, to Uhde GmbH. Heat exchanger incorporating nitriding-resistant material. 4,401,153, Cl. 165-134.00R.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Novel process for the preparation of tetra-substituted cyclopropane compounds. 4,401,601, Cl. 260-464.000.

Martel, Jacques; Tessier, Jean; and Girault, Pierre, to Roussel Uclaf. Pesticidal 3-(buta-1',3'-dienyl)-cyclopropane-1-carboxylic acid esters. 4,401,673, Cl. 424-263.000.

Martens, Veronika: *See*—
Knothe, Erich; Melcher, Franz-Josef; Ober, Jurgen; Sodler, Walter; and Martens, Veronika, 4,401,176, Cl. 177-180.000.

Martensson, Arvid: *See*—
Glans, Jan-Erik; and Martensson, Arvid, 4,401,004, Cl. 83-875.000.

Martin, Alan. Tool for setting blind fasteners. 4,400,960, Cl. 72-114.000.

Martin Marietta Corporation: *See*—
Gerber, Arthur H., 4,401,472, Cl. 106-90.000.

Martin San Lorenzo, Daniel; Regife Vega, Jose M.; and Nogueira, Eduardo D. Process for the production of electrolytic zinc or high purity zinc salts from secondary zinc raw-materials. 4,401,531, Cl. 204-114.000.

Martin & Starchuk Limited: *See*—
Martin, William E., 4,400,956, Cl. 70-394.000.

Martin, Sylvia, to Occidental Chemical Corporation. Zinc alloy plating baths with condensation polymer brighteners. 4,401,526, Cl. 204-43.00Z.

Martin, Van C., to International Business Machines Corporation. Variable resolution, single array, interlace ink jet printer. 4,401,991, Cl. 346-75.000.

Martin, Walter H.; and Briley, George C., to Refrigeration Engineering Corporation. Slush ice maker. 4,401,449, Cl. 62-59.000.

Martin, William E., to Martin & Starchuk Limited. Skeleton key kit. 4,400,956, Cl. 70-394.000.

Martinez, Eugene E., to Reibel, Robert H. Album. 4,400,899, Cl. 40-391.000.

Martino, Germain: *See*—
Juguin, Bernard; Martino, Germain; and Miquel, Jean, 4,401,557, Cl. 208-139.000.

Martino, William L., Jr.; and Moench, Jerry D., to Motorola, Inc. Substrate bias voltage regulator. 4,401,897, Cl. 307-297.000.

Martzloff, Francois D.; and Jones, Marshall G., to General Electric Company. Metal vapor arc lamp having thermal link diminishable in heat conduction. 4,401,912, Cl. 313-17.000.

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Ohkubo, Hiroyuki; Maru, Hiroshi; Kato, Yoshito; and Hashimoto, Toshio, 4,400,890, Cl. 33-125.00C.

Maruno, Susumu: *See*—
Ushihara, Masaharu; Nagahiro, Michinori; Yamazaki, Humio; Nakagawa, Masami; Miyaji, Noboru; and Maruno, Susumu, 4,401,998, Cl. 346-140.00R.

Maruyama, Hirotaka: *See*—
Kashiwabara, Norio; Maruyama, Hirotaka; Ishii, Tetuo; and Kondo, Satoru, 4,401,657, Cl. 424-177.000.

Maruyama, Masao: *See*—
Doi, Yoshihiko; Hirayama, Toshikazu; Miyawaki, Yasushi; and Maruyama, Masao, 4,401,297, Cl. 266-252.000.

Masaki, Takeharu: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, 4,401,757, Cl. 435-71.000.

Maschinenfabrik Goebel GmbH: *See*—
Thomas, Hermann; and Jakob, Hans, 4,401,428, Cl. 493-415.000.

Maschke, Alfred W. Klystron having electrostatic quadrupole focusing arrangement. 4,401,918, Cl. 315-5.340.

Mason, Carl J.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,401,670, Cl. 424-250.000.

Mason, John D. Archery bow sight. 4,400,887, Cl. 33-265.000.

Massachusetts Institute of Technology: *See*—
Weaver, James C., 4,401,755, Cl. 435-34.000.

Massaro, Bruno; and Massaro, Vincent. Arch preform and method of constructing arch passageway. 4,400,917, Cl. 52-86.000.

Massaro, Vincent: *See*—
Massaro, Bruno; and Massaro, Vincent, 4,400,917, Cl. 52-86.000.

Mastiff Security Systems Limited: *See*—
Taylor, Derek R., 4,401,977, Cl. 340-539.000.

Masuda, Hirotsugu: *See*—
Tsuchiya, Kazuo; Masuda, Hirotsugu; and Sakaguchi, Yuji, 4,401,325, Cl. 285-231.000.

Masuda, Youichi: *See*—
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,401,902, Cl. 307-415.000.

Materias Primas, Monterrey, S.A.: *See*—
Caballero, Alejandro J.; and Holcombe, Ricardo I., 4,401,638, Cl. 423-340.000.

Matsubara, Hideyuki: *See*—
Kato, Yoshito; Matsubara, Hideyuki; and Hashimoto, Toshio, 4,401,930, Cl. 318-603.000.

Matsui, Mitsuo: *See*—
Nozawa, Ryoichiro; and Matsui, Mitsuo, 4,402,051, Cl. 364-475.000.

Matsui, Takeki: *See*—
Ohmura, Kaoru; Matsuura, Masaru; Matsui, Takeki; and Kimura, Takeo, 4,401,966, Cl. 338-32.00R.

Matsui, Yoshi. Transfer papers. 4,401,722, Cl. 428-488.000.

Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, 4,401,592, Cl. 260-112.00B.

Matsunaga, Tetsuzo: *See*—
Kasuya, Katsuhiko; Fujiwara, Mitsuru; Imai, Masaya; Matsunaga, Tetsuzo; and Takahashi, Yasuo, 4,401,420, Cl. 418-201.000.

Matsuo, Seitaro; Yoshihara, Hideo; and Yamazaki, Shinichi, to Nippon Telegraph & Telephone Public Corporation. Plasma deposition apparatus. 4,401,054, Cl. 118-723.000.

Matsuoka, Hideoki: *See*—
Okuyama, Hiroo; and Matsuoka, Hideoki, 4,401,320, Cl. 280-801.000.

Matsuoka, Mitsutoshi, to Arakawa, Takeshi, a part interest. Apparatus and method for reforming high-molecular weight oils. 4,401,606, Cl. 261-93.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fujita, Osamu, 4,402,029, Cl. 361-90.000.
Kawai, Jun; and Katsura, Akira, 4,401,391, Cl. 400-120.000.
Kusunoki, Shigeru; Mori, Keijiro; and Kanazawa, Takato, 4,401,884, Cl. 219-492.000.
Nakamura, Kazuo; and Higashionji, Masaru, 4,402,027, Cl. 360-123.000.
Okamura, Yasushi; and Tanaka, Kiichiro, 4,402,071, Cl. 369-67.000.
Shirai, Iwao; Momose, Keigo; Sawai, Tadashi; Komatsu, Masakazu; Inoue, Takao; and Wakahata, Tamotsu, 4,401,733, Cl. 429-174.000.
Ushihara, Masaharu; Nagahiro, Michinori; Yamazaki, Humio; Nakagawa, Masami; Miyaji, Noboru; and Maruno, Susumu, 4,401,998, Cl. 346-140.00R.
Yamada, Kenichi; Yokogawa, Seiji; Fujita, Shigehiko; Takenaka, Kiyoshi; and Tanoue, Koichi, 4,401,328, Cl. 289-2.000.
Yoshimura, Susumu; and Murakami, Mutsuaki, 4,401,590, Cl. 252-514.000.

Matsushita Electric Works, Ltd.: *See*—
Odaka, Kuniyuki; Yamamura, Yukio; Ishino, Koichi; and Nakamura, Masayuki, 4,401,929, Cl. 318-466.000.

Matsushita, Yukio; and Gohara, Yoshihiro, to Yamaha Hatsudoki Kabushiki Kaisha. Reduction of distortion of portions of the cylinder wall in a two stroke engine. 4,401,061, Cl. 123-41.840.

Matsuura, Masaru: *See*—
Ohmura, Kaoru; Matsuura, Masaru; Matsui, Takeki; and Kimura, Takeo, 4,401,966, Cl. 338-32.00R.

Matsuzaki, Kenji; Horino, Akio; Terai, Yasuharu; and Kato, Shohei. Fuel tank for motorcycle. 4,401,309, Cl. 280-5.00A.

Matthews, Douglas A., to Du Pont de Nemours, E. I., and Company. Hollow core holder. 4,401,336, Cl. 294-94.000.

Mattis, John S.; Ramirez, Eleazar F.; and Vrcelj, Michael J., to Raychem Corporation. Heat recoverable closure device having crack propagation prevention means. 4,401,842, Cl. 174-71.00R.

Matveev, Georgy G.: *See*—
Leonov, Alexandr Y.; Matveev, Georgy G.; Morozov, Leonid V.; and Bobovsky, Vladimir A., 4,401,019, Cl. 99-471.000.

Matzinger, David P., to Dynapol Shareholders Liquidating Trust. Process for separating acetamidoethylene from crude preparation products. 4,401,516, Cl. 203-33.000.

Mayer, Ferdy. Sensitive relay with high threshold stability. 4,402,033, Cl. 361-187.000.

Mayer, Linda J.: *See*—
Duva, Robert; and Mayer, Linda J., 4,401,527, Cl. 204-47.000.

Mazzacca, Alfred J.: *See*—
Jhaveri, Vidyut; Mazzacca, Alfred J.; and Snyder, Harold, 4,401,569, Cl. 210-610.000.

McAlister, Roy E. Solar heating system, and improved heat collecting and radiating components, for livestock-confining buildings. 4,401,105, Cl. 126-422.000.

McCann, James L. Rotary engine. 4,401,070, Cl. 123-229.000.

McConnell, Richard L.: *See*—
Davis, Donald C.; McConnell, Richard L.; and Meyer, Max F., Jr., 4,401,720, Cl. 428-483.000.

McCray, Charles M.: *See*—
Alexander, Douglas E.; and McCray, Charles M., 4,401,393, Cl. 400-208.000.

McDevitt, John E., Jr.; and Petersen, Richard W., to Augat Inc. Programmable plug. 4,401,353, Cl. 339-18.00C.

McDonald, Dean: *See*—
Williams, Michael R.; and McDonald, Dean, 4,401,264, Cl. 239-126.000.

McDonald, Ray S.: *See*—
Hartlaub, Jerome T.; and McDonald, Ray S., 4,401,120, Cl. 128-419.0PT.

McDonald, Walter; and Seitel, Norbert F. Parts feeding bowl with orienting means. 4,401,203, Cl. 198-392.000.

McDonough, Kevin C.; and Guttag, Karl M., to Texas Instruments Incorporated. Microprocessor with strip layout of busses, ALU and registers. 4,402,044, Cl. 364-200.000.

McDonough, Kevin C.: *See*—
Guttag, Karl M.; McDonough, Kevin C.; and Laws, Gerald E., 4,402,043, Cl. 364-200.000.

McEdwards, James A., to Rockwell International Corporation. Nuclear reactor sealing system. 4,401,619, Cl. 376-206.000.

McGarr, John W., to Atlantic Richfield Company. Apparatus for monitoring liquid flow rates. 4,400,975, Cl. 73-204.000.

McGarry, Dennis L.; and Roehrig, Frederick K., to Owens-Corning Fiberglas Corporation. Metal atomization. 4,401,609, Cl. 264-11.000.

McGrail, John F.; and McGrail, Lois M. Automatic coffee-brewing apparatus. 4,401,014, Cl. 99-283.000.

McGrail, Lois M.: *See*—
McGrail, John F.; and McGrail, Lois M., 4,401,014, Cl. 99-283.000.

McKay, Angus T. Fiberglass oil well sucker rod. 4,401,396, Cl. 403-13.000.

McKee, Arnold D.: *See*—
Simonds, Gary; and McKee, Arnold D., 4,401,097, Cl. 124-23.00R.

McKeighen, Ronald E.; and Buchin, Michael P., to Siemens Gammasonics, Inc. Permutating analog shift register variable delay system. 4,401,957, Cl. 333-165.000.

McKinney, James C. Sprayer for squeeze bottle. 4,401,270, Cl. 239-327.000.

McKinney, Maurice E., to Boeing Company, The. Method of winding composite panels. 4,401,495, Cl. 156-173.000.

McLaughlin, Donald W.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,402,077, Cl. 370-63.000.

McVey, James M.; Romero, Hector G., Jr.; and Wagoner, James D., to International Business Machines Corporation. Full page display apparatus for text processing system. 4,401,985, Cl. 340-799.000.

McWaters, Lynn D.; and Sanner, Medford D., to Recognition Equipment Incorporated. OCR And bar code reading using area array. 4,402,088, Cl. 382-68.000.

Mead Corporation, The: *See*—
Spamer, William S., 4,401,223, Cl. 211-134.000.
Suttles, James M., 4,401,221, Cl. 211-49.00D.

Mearns, Alec R., to Timex Corporation. Rotatable connector for bangle wristwatch attachment. 4,401,388, Cl. 368-282.000.

Mechanical Technology Incorporated: *See*—
Rauch, Jeffrey S., 4,400,941, Cl. 60-520.000.

Meckel, Walter: *See*—
Wenzel, Wolfgang; and Meckel, Walter, 4,401,786, Cl. 524-591.000.

Medford, George F., to General Electric Company. Process for applying a second silicone resin coating composition over a first silicone resin coating composition. 4,401,718, Cl. 428-448.000.

Medi-Lab, Medicinsk Laboratorium A/S: *See*—
Buus, Ole; and Nielsen, Michael J., 4,401,889, Cl. 250-328.000.

Medtronic, Inc.: *See*—
Hartlaub, Jerome T.; and McDonald, Ray S., 4,401,120, Cl. 128-419.0PT.
Herpers, Lodewijk-Jozef, 4,401,119, Cl. 128-419.0PG.

Melcher, Franz-Josef: *See*—
Knothe, Erich; Melcher, Franz-Josef; Ober, Jurgen; Sodler, Walter; and Martens, Veronika, 4,401,176, Cl. 177-180.000.

Melin, Ake L.; and Svensson, Vide H., to SAB Nife AB. Process for the recovery of metals from the scrap from nickel-cadmium electric storage batteries. 4,401,463, Cl. 75-44.00S.

Melissa, Raymond F.; Grummett, Lorne H.; and Fischer, Joseph J., to Trilog, Inc. Ribbon control system for multiple color impact printer. 4,401,390, Cl. 400-240.300.

Mentani, Akiyoshi: *See*—
Nakamoto, Hiromasa; and Mentani, Akiyoshi, 4,400,954, Cl. 70-186.000.

Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,401,669, Cl. 424-248.540.
Patchett, Arthur A.; and Taub, David, 4,401,676, Cl. 424-309.000.
Peik, Jerry A.; Steenbergen, Suzanna M.; and Hayden, Harold R., 4,401,760, Cl. 435-101.000.
Wang, Ching C., 4,401,671, Cl. 424-251.000.

Merlin Gerin: *See*—
Boichot-Castagne, Bernard; Case, Roger; and Marin-Pache, Reynald, 4,401,872, Cl. 200-153.00G.

Merrick, Howard F.: *See*—
Benn, Raymond C.; Mihalisin, John R.; Curwick, Leroy R.; and Merrick, Howard F., 4,401,622, Cl. 420-449.000.

Merry, Carl A., to Schaefer Marine, Inc. Pelican hook. 4,401,333, Cl. 294-83.00R.

Merton, Wilfred R.; and Pieterick, Jerome A., to Minnesota Mining and Manufacturing Company. Aerosol fan sprayhead. 4,401,272, Cl. 239-337.000.

Mertzweiller, Guy: *See*—
Pierrel, Michel; and Mertzweiller, Guy, 4,401,478, Cl. 148-15.000.

Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Bansemir, Horst; and Buchs, Wolfgang, 4,401,710, Cl. 428-229.000.

Meurer, C. Lonnie, to Meurer Industries, Inc. Sediment collecting device. 4,401,576, Cl. 210-803.000.

Meurer Industries, Inc.: *See*—
Meurer, C. Lonnie, 4,401,576, Cl. 210-803.000.

Meyer, Hans-Friedrich: *See*—
Rodewald, Gerhard; Opel, Detlef; Brausfeld, Walter; Gottling, Helmut; Meyer, Hans-Friedrich; and Moller, Rudolf, 4,401,293, Cl. 251-324.000.

Meyer, Helmut: *See*—
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Meyer, Jeffry R.; Billings, John S., Jr.; Spindle, Harvey E.; and Hofmann, Charles F. Explosion resistant insulator and method of making same. 4,401,841, Cl. 174-31.00R.

Meyer, Max F., Jr.: *See*—
Davis, Donald C.; McConnell, Richard L.; and Meyer, Max F., Jr., 4,401,720, Cl. 428-483.000.

Meyer, Theodore O.; and van Ommering, Gerrit, to Ford Aerospace & Communications Corporation. Insulated feedthrough expansion seal. 4,401,734, Cl. 429-181.300.

Meyer, Willy, to Ciba-Geigy Corporation. Novel substituted benzo-2-thia-1,3-diazin-4(3H)-one-2,2-dioxides. 4,401,458, Cl. 71-91.000.

Michalski, Lothar: *See*—
Epper, Wolfgang; Michalski, Lothar; and Schonteich, Peter, 4,401,564, Cl. 210-150.000.

Michaud, Joseph W.: *See*—
Odhner, Oliver R.; and Michaud, Joseph W., 4,401,845, Cl. 174-113.00R.

Michaux, Jacques M., to Sacilor Acieries et Laminoirs de Lorraine. Improved rolling mills apparatus for rolling rails with universal and edging passes wherein edging passes are made in a reversing universal finishing stand. 4,400,962, Cl. 72-222.000.

Micheron, Francois: *See*—
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Michigan Pipe Fittings Co. Div. of Michigan Hanger Co.: *See*—
Rumble, Ray M., 4,401,324, Cl. 285-90.000.

Micro-Plate, Inc.: *See*—
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Microdot Inc.: *See*—
Rehder, John E., 4,401,469, Cl. 75-130.00R.

Microsource, Inc.: *See*—
Basawapatna, Ganesh R., 4,401,952, Cl. 330-277.000.

Midas International Corporation: *See*—
Csaszar, Gabor; Goldman, Fred M.; Oehley, Gernot; and Svoboda, Edward J., 4,401,089, Cl. 123-536.000.

Mihalisin, John R.: *See*—
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Mihashi, Kazutaka: *See*—
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Mijnders, Gijsbert J.: *See*—
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Miki, Hiroyuki, to Nissan Motor Co., Ltd. Emergency locking seat belt retractor. 4,401,282, Cl. 242-107.40A.
Miklos, Milan J.: *See*—
Hardy, Eugene C.; and Miklos, Milan J., 4,401,302, Cl. 271-251.000.
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Anders, Gene A.; Larson, Herbert J.; and Miller, Charles R., 4,401,154, Cl. 165-151.000.
Milier, Howard A.; and Nichols, Charles S., to United States of America, Navy. Acoustic envelope having minimal vibration and flow induced noises. 4,402,069, Cl. 367-154.000.
Miller, James A.: *See*—
Lobmeyer, Raymond J.; and Miller, James A., 4,400,937, Cl. 60-422.000.
Miller, Kenneth F.: *See*—
Liu, Ping Y.; and Miller, Kenneth F., 4,401,785, Cl. 524-508.000.
Miller, Robert E.: *See*—
Russo, Joseph; Sonder, Richard; Miller, Robert E.; and Cauthen, Mark E., 4,401,036, Cl. 108-146.000.
Miller, Stephen J., to Chevron Research Company. Hydrocarbon conversion with low-sodium crystalline silicates. 4,401,555, Cl. 208-111.000.
Miller, Taylor C., Jr.: *See*—
DuLoft, Walter A., 4,401,095, Cl. 123-590.000.
Milliken Research Corporation: *See*—
Frentress, Zane, 4,401,024, Cl. 101-93.010.
Milton, Curtis E., Jr.: *See*—
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Milwaukee Electric Tool Corporation: *See*—
Palm, Bernhard, 4,400,995, Cl. 74-527.000.
Minegishi, Sokichi; Takizawa, Tozo; Kawamura, Hideo; and Sagawa, Nobukazu, to Jidosha Kiki Co., Ltd.; Isuzu Motors Ltd.; and Kyoto Ceramic Co., Ltd. Glow plugs for use in diesel engines. 4,401,065, Cl. 123-145.00A.
Minejima, Teruo; and Sakurai, Isao, to Konishiroku Photo Industry Co., Ltd. Image transfer type copying machine. 4,401,382, Cl. 355-3.0SH.
Ministry of International Trade & Industry: *See*—
Yabe, Akira; Mori, Yasuo; and Hijikata, Kunio, 4,401,148, Cl. 165-1.000.
Mink, Jan B. Apparatus and method for holding jewelry. 4,401,219, Cl. 206-566.000.
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Backlund, Sven; and Grimm, Forrest R., 4,401,965, Cl. 337-408.000.
Chern, Mao-Jin; and Lowrey, Robert D., 4,401,537, Cl. 204-159.110.
Fabel, George W.; and Lindahl, Richard W., 4,402,000, Cl. 346-155.000.
Hansen, Dennis D., 4,401,271, Cl. 239-337.000.
Incremona, Joseph H., 4,401,743, Cl. 430-157.000.
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Steel, Cynthia L., 4,401,780, Cl. 524-225.000.
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Miquel, Jean: *See*—
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Mirenna, Luigi: *See*—
Garlaschelli, Luigi; Gozzo, Franco; and Mirenna, Luigi, 4,401,675, Cl. 424-285.000.
Misra, Sudhansu S.: *See*—
Szymborski, Joseph; Misra, Sudhansu S.; Eggers, Mark L.; and Burrows, Brian W., 4,401,730, Cl. 429-53.000.
Mita Industrial Co. Ltd.: *See*—
Miyakawa, Nobuhiro; and Maekawa, Kouzi, 4,401,741, Cl. 430-110.000.
Mitchell, David S., to Chevron Research Company. Solvent extraction method. 4,401,551, Cl. 208-11.0LE.
Mitomo Co., Ltd.: *See*—
Kobayashi, Kazuhiko, 4,401,504, Cl. 156-505.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hamano, Isao; and Yabunaka, Kiyoshi, 4,401,252, Cl. 228-110.000.
Kinoshita, Minoru; and Sasaki, Yoshio, 4,400,949, Cl. 62-140.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Senga, Takao; Koishi, Masafumi; and Tsubai, Yasuo, 4,401,739, Cl. 430-16.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Shindo, Mizuo; Yamamoto, Takashi; Fukunaga, Osamu; and Yamamori, Hisayoshi, 4,401,567, Cl. 210-500.200.
Mitsui Petrochemical Industries Ltd.: *See*—
Kioka, Mamoru; Kitani, Hiroaki; and Kashiwa, Norio, 4,401,589, Cl. 252-429.00B.
Mitsui Toatsu Chemicals, Inc.: *See*—
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,401,777, Cl. 523-451.000.
Miura, Kazuhiko; Kawabata, Takakazu; Hattori, Tadashi; and Ueno, Yoshiki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Diagnostic apparatus for internal combustion engine ignition system. 4,401,948, Cl. 324-378.000.
Miwa, Naoto; and Segawa, Yoshihiro, to Nippondenso Co., Ltd. Gas sensor. 4,401,967, Cl. 338-34.000.
Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling an air ratio of the air-fuel mixture supplied to an internal combustion engine. 4,401,086, Cl. 123-489.000.
Miyaji, Noboru: *See*—
Ushihara, Masaharu; Nagahiro, Michinori; Yamazaki, Humio; Nakagawa, Masami; Miyaji, Noboru; and Maruno, Susumu, 4,401,998, Cl. 346-140.00R.
Miyakawa, Nobuhiro; and Maekawa, Kouzi, to Mita Industrial Co. Ltd. One-component type developer. 4,401,741, Cl. 430-110.000.
Miyakoshi, Shinichi; and Isono, Tokio, to Honda Giken Kogyo Kabushiki Kaisha. Front suspension for motocycle. 4,401,316, Cl. 280-277.000.
Miyawaki, Yasushi: *See*—
Doi, Yoshihiko; Hirayama, Toshikazu; Miyawaki, Yasushi; and Maruyama, Masao, 4,401,297, Cl. 266-252.000.
Miyazaki, Takaaki; Hashimoto, Sadakatsu; and Nishiyama, Mitsuru, to Sharp. Lead-in electrode structure for electrochromic displays of the segmented type. 4,401,370, Cl. 350-357.000.
Miyazaki, Togo; and Suehiro, Junichi, to Nippon Electric Co., Ltd. Fluorescent display tubes and method of driving the same. 4,401,982, Cl. 340-758.000.
Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, to Hitachi, Ltd. Rotary type optical switch. 4,401,365, Cl. 350-96.200.
Mizote, Masanori: *See*—
Itou, Tomio; and Mizote, Masanori, 4,402,057, Cl. 364-900.000.
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Kaneko, Shoroku; Yamaoka, Sigenori; Mizuno, Masuo; and Okabe, Yukihiro, 4,401,499, Cl. 156-307.300.
Mobay Chemical Corporation: *See*—
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Bridger, Robert F., 4,401,470, Cl. 106-20.000.
Choi, Byung C.; and Graziani, Kenneth R., 4,401,554, Cl. 208-64.000.
Chu, Pochen; and Dwyer, Francis G., 4,401,572, Cl. 210-681.000.
Hegedus, Allan J., 4,400,973, Cl. 73-56.000.
Hungerford, Gordon P., 4,401,702, Cl. 428-35.000.
Krieg, Donald J., 4,401,256, Cl. 229-53.000.
Mochizuki, Kiyofumi, to Kokusai Denshi Denwa Kabushiki Kaisha. Optical repeater system for optical communication. 4,401,364, Cl. 350-96.160.
Modic, Frank J., to General Electric Company. Solid silicone rubber compositions as insulators from fire for electrical components. 4,401,491, Cl. 156-48.000.
Modine Manufacturing Company: *See*—
Costello, Norman F.; and Granetzke, Dennis C., 4,401,091, Cl. 123-557.000.
Schey, John A., 4,400,965, Cl. 72-334.000.
MoDo-Chemetics AB: *See*—
Olson, Torbjorn; Olauson, Lars G.; and Candolin, Carl-Johan, 4,401,510, Cl. 162-19.000.
Moench, Jerry D.: *See*—
Martino, William L., Jr.; and Moench, Jerry D., 4,401,897, Cl. 307-297.000.
Moeser, Denis S., to Leisure Products, Inc. Swivel assembly. 4,401,287, Cl. 248-425.000.
Moffatt, Pierre R.: *See*—
Guay, Raymond; and Moffatt, Pierre R., 4,400,978, Cl. 73-453.000.
Moller, Rudolf: *See*—
Rodewald, Gerhard; Opel, Detlef; Braunfeld, Walter; Gottling, Helmut; Meyer, Hans-Friedrich; and Moller, Rudolf, 4,401,293, Cl. 251-324.000.
Momma, Naohiro; and Taniguchi, Hiroyuki, to Hitachi, Ltd. Semiconductor element capable of withstanding high voltage. 4,402,001, Cl. 357-38.000.
Momose, Keigo: *See*—
Shirai, Iwao; Momose, Keigo; Sawai, Tadashi; Komatsu, Masakazu; Inoue, Takao; and Wakahata, Tamotsu, 4,401,733, Cl. 429-174.000.
Monier, Jean-Claude: *See*—
Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, 4,401,822, Cl. 548-567.000.
Monnier, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude. Respirator appliances. 4,401,115, Cl. 128-204.230.
Monsanto Company: *See*—
Howe, Robert K.; and Liu, Kou-Chang, 4,401,457, Cl. 71-88.000.
Sikorski, James A.; and Hoobler, Mary A., 4,401,455, Cl. 71-087.000.
Sikorski, James A.; and Hoobler, Mary A., 4,401,604, Cl. 260-968.000.
Montedison S.p.A.: *See*—
Albizzati, Enrico; Bassi, Ivano; Foschini, Giorgio; Parodi, Sandro; and Pirinoli, Franco, 4,401,641, Cl. 423-498.000.
Garlaschelli, Luigi; Gozzo, Franco; and Mirenna, Luigi, 4,401,675, Cl. 424-285.000.

Moon, Ronald L.: *See*—
Antypas, George A.; Bell, Ronald L.; and Moon, Ronald L., 4,400,868, Cl. 29-572.000.

Moorehead, Jack F. Air dryer. 4,400,948, Cl. 62-3.000.

Moranduzzo, Giampaolo; Abels, Theodor; and Stuhr, Hans-Waldemar, to Linde Aktiengesellschaft. Drive units. 4,400,939, Cl. 60-431.000.

Morehouse, James: *See*—
Anderson, Kurt M.; and Morehouse, James, 4,402,025, Cl. 360-98.000.

Morgan Construction Company: *See*—
Gilvar, Martin; and Russell, Robert B., 4,401,481, Cl. 148-12.00B.

Morgan, Peter E. D., to Rockwell International Corporation. Si_3N_4 Ceramic densified using Sc_2O_3 and SiO_2. 4,401,768, Cl. 501-98.000.

Mori, Keijiro: *See*—
Kusunoki, Shigeru; Mori, Keijiro; and Kanazawa, Takato, 4,401,884, Cl. 219-492.000.

Mori, Yasuo: *See*—
Yabe, Akira; Mori, Yasuo; and Hijikata, Kunio, 4,401,148, Cl. 165-1.000.

Mori, Yoshiaki: *See*—
Ishii, Eiichi; Mori, Yoshiaki; and Toyoda, Minoru, 4,401,885, Cl. 219-523.000.

Moriguchi, Haruhiko; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Heat-sensitive type multi-gradation image recording apparatus. 4,401,993, Cl. 346-76.0PH.

Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, to Shionogi & Co., Ltd. Semi-synthesis of human insulin. 4,401,757, Cl. 435-71.000.

Morikawa, Eiji, to Sanyo Electric Co., Ltd. Multiple speaker. 4,401,857, Cl. 179-110.00A.

Morin, George A., to Leger' Equipment Corp. Air bearing shelf. 4,401,300, Cl. 270-55.000.

Morin, Rene, to Renault Vehicules Industriels. Built-in hydraulic automatic device for advancing the injection of a diesel engine. 4,401,088, Cl. 123-502.000.

Morinaga, Masaru, to NSK - Warner KK. Seat belt buckle. 4,400,857, Cl. 24-230.00A.

Morishita, Mitsuharu, to NTN Toyo Bearing Co., Ltd. Control device for battery charging AC generator. 4,401,937, Cl. 322-28.000.

Morizot, Georges: *See*—
Bloise, Rene; Morizot, Georges; and Boissonnade, Genevieve, 4,401,644, Cl. 423-617.000.

Moroski, Adam A.: *See*—
Ziner, Edward H.; and Moroski, Adam A., 4,401,331, Cl. 293-128.000.

Morozov, Leonid V.: *See*—
Leonov, Alexandr Y.; Matveev, Georgy G.; Morozov, Leonid V.; and Bobovsky, Vladimir A., 4,401,019, Cl. 99-471.000.

Morris, Donald G., to Garrett, Betty Ann. Electrical efficiency meter. 4,401,943, Cl. 324-157.000.

Morris, Hugh C.: *See*—
Hakes, Gary A.; Shook, Norma G.; Cackley, George W.; Burdette, Stephen D.; and Morris, Hugh C., 4,401,132, Cl. 137-1.000.

Morrison, Willard L., to Tultex Corporation. Antimicrobial non-woven fabric. 4,401,712, Cl. 428-289.000.

Morton, John; and Stevens, Keith D., to Cabeform Limited. Pulse controllers. 4,401,926, Cl. 318-376.000.

Moser, Richard A.; Schaffer, J. Thomas; and Weinstein, Richard, to Champion Spark Plug Company. Electrostatic voltage control circuit. 4,402,030, Cl. 361-93.000.

Moses, Peter R.; Taylor, Alwyn H.; and Turchan, Michael J., to Duracell International Inc. Non-aqueous Li/MnO_2 cell. 4,401,735, Cl. 429-195.000.

Moshe, Gideon B.: *See*—
Lwoff, Andre; Yerushalmi, Aharon; Cohen, Irun R.; and Moshe, Gideon B., 4,401,114, Cl. 128-200.140.

Moskowitz, Larry N.; and Klar, Erhard, to SCM Corporation. Spray-and-fuse self-fluxing alloy powder coating. 4,401,724, Cl. 428-564.000.

Moss, William E.; Waser, Shlomo; and Priel, Ury. Bidirectional dual port serially controlled programmable read-only memory. 4,402,067, Cl. 365-219.000.

Motherwell, William B.: *See*—
Barton, Derek H.; Motherwell, William B.; and Zard Zard, Samir, 4,401,596, Cl. 260-239.550.

Motonami, Masanao: *See*—
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, 4,401,321, Cl. 280-804.000.

Motorola, Inc.: *See*—
Davis, Darrell E., 4,401,950, Cl. 330-255.000.
Jarrett, Robert B.; and Pace, Wilson D., 4,401,974, Cl. 340-347.0AD.
Martino, William L., Jr.; and Moench, Jerry D., 4,401,897, Cl. 307-297.000.
Newton, Anthony D., 4,402,011, Cl. 358-154.000.
Sommerer, Raymond, 4,401,898, Cl. 307-310.000.

Motoyama, Keiichi: *See*—
Iwamura, Eiji; and Motoyama, Keiichi, 4,402,037, Cl. 361-423.000.

Mouri, Yasunori: *See*—
Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, 4,400,974, Cl. 73-118.000.

Mowbray, Dorian F.: *See*—
Jarrett, Boaz A.; and Mowbray, Dorian F., 4,401,084, Cl. 123-450.000.

MTU Motoren-Und Turbinen-Union Friechichshafen GmbH: *See*—
Deutschmann, Herbert; and Ruetz, Georg, 4,400,945, Cl. 60-612.000.

Mueller, Hans R.: *See*—
Gfeller, Fritz R.; and Mueller, Hans R., 4,402,090, Cl. 455-601.000.

Mueller, Horst, to Siemens Aktiengesellschaft. Synchronizing device for a time division multiplex system. 4,402,080, Cl. 370-100.000.

Muller, Alfred: *See*—
Ammerling, Willi J.; and Muller, Alfred, 4,401,294, Cl. 266-112.000.

Muller, Christian, to Compagnie Industrielle Radioelectrique. Apparatus for the photographic reception of images transmitted by means of a modulated electrical signal. 4,402,016, Cl. 358-280.000.

Muller, Hans, to Grapha-Holding AG. Devices for accelerating sheets in gathering machines. 4,401,299, Cl. 270-54.000.

Muller, Peter, to Andrews Paper & Chemical Co., Inc. Diazotype compositions with improved printing performance. 4,401,744, Cl. 430-179.000.

Muller, Rolf: *See*—
Ferchland, Dieter; Kussmaul, Ulrich; Langer, Manfred; and Muller, Rolf, 4,401,603, Cl. 260-543.200.

Multiform Desiccants, Inc.: *See*—
Huber, Paul W., 4,401,447, Cl. 55-387.000.

Multinorm, B.V.: *See*—
Vissers, Hermanus H.; and Mijnders, Gijsbert J., 4,401,022, Cl. 100-100.000.

Munk, Enno C.: *See*—
Vorst, Henricus H. M.; Bastiaens, Jozef J. J.; and Munk, Enno C., 4,401,992, Cl. 346-76.00L.

Munk, Kurt, to Ciba-Geigy Corporation. Pourable solid mixture. 4,401,776, Cl. 523-443.000.

Murakami, Mutsuaki: *See*—
Yoshimura, Susumu; and Murakami, Mutsuaki, 4,401,590, Cl. 252-514.000.

Murakami, Tsutomu: *See*—
Igari, Akira; and Murakami, Tsutomu, 4,401,566, Cl. 210-351.000.

Murata, Hiroshi: *See*—
Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, 4,402,056, Cl. 364-705.000.

Murata Kikai Kabushiki Kaisha: *See*—
Maeda, Yoshiyasu, 4,400,931, Cl. 57-336.000.

Murata Manufacturing Co., Ltd.: *See*—
Iwamura, Eiji; and Motoyama, Keiichi, 4,402,037, Cl. 361-423.000.

Murata, Toshitake: *See*—
Nitta, Tsuneo; Murata, Toshitake; Tsuboi, Hiroyuki; and Kondo, Takashi, 4,401,851, Cl. 179-1.0SD.

Muroran Institute of Technology: *See*—
Watabe, Tomiji; Kondo, Hideo; Okuda, Kyokai; Yano, Kenji; and Asano, Seiichi, 4,400,940, Cl. 60-502.000.

Murphy, Brian J. M.: *See*—
Hartshorn, Frank; le Vesconte, Ivor J. R.; Murphy, Brian J. M.; and Storer, Richard E., 4,400,839, Cl. 12-12.500.

Murphy, Richard E.: *See*—
Bookout, Charles C.; Heeney, John P.; and Murphy, Richard E., 4,400,998, Cl. 74-740.000.

Musci, Nicola, to Fratelli Musci. Shoe with removably-mounted heel. 4,400,893, Cl. 36-24.500.

Muto, Yoshihiko: *See*—
Ohashi, Toshio; Muto, Yoshihiko; and Takasaki, Masaru, 4,401,013, Cl. 98-2.110.

Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, to BASF Aktiengesellschaft. Electrically conductive polypyrrole derivatives. 4,401,545, Cl. 204-291.000.

Nabisco Brands, Inc.: *See*—
Brown, Gary M.; Bosco, Peter M.; and Danielson, Robert L., 4,401,685, Cl. 426-576.000.

Naegele, Dieter: *See*—
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, 4,401,545, Cl. 204-291.000.

Naffa, Faisal A., to Brooks & Perkins, Inc. Shear or compression release lock. 4,401,286, Cl. 244-137.00R.

Nagahiro, Michinori: *See*—
Ushihara, Masaharu; Nagahiro, Michinori; Yamazaki, Humio; Nakagawa, Masami; Miyaji, Noboru; and Maruno, Susumu, 4,401,998, Cl. 346-140.00R.

Nagaoka, Tateki: *See*—
Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.

Nagashima, Hideyuki: *See*—
Kamijo, Ken; and Nagashima, Hideyuki, 4,401,928, Cl. 318-466.000.

Nagata, Toru: *See*—
Tamamura, Hideo; and Nagata, Toru, 4,401,379, Cl. 354-214.000.

Nagel, Jens, to Nordischer Maschinenbau Rud. Baader GmbH+Co. KG. Needle bar drawing device. 4,400,853, Cl. 19-129.00R.

Nakagawa, Masami: *See*—
Ushihara, Masaharu; Nagahiro, Michinori; Yamazaki, Humio; Nakagawa, Masami; Miyaji, Noboru; and Maruno, Susumu, 4,401,998, Cl. 346-140.00R.

Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Exposure control arrangement for photographic cameras. 4,401,373, Cl. 354-23.00D.

Nakajima, Akira: *See*—
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,401,902, Cl. 307-415.000.

Nakamoto, Hiromasa; and Mentani, Akiyoshi, to Toyo Kogyo Co., Ltd; and Yuhshin Co., Ltd. Steering lock assembly. 4,400,954, Cl. 70-186.000.

Nakamura, Kazuo; and Higashionji, Masaru, to Matsushita Electric Industrial Co., Ltd. Magnetic transducer with built-in step-up transformer. 4,402,027, Cl. 360-123.000.

Nakamura, Kyuzo; Ohta, Yoshifumi; and Yamada, Taiki, to Nihon Shinku Gijutsu Kabushiki Kaisha. Ferromagnetic high speed sputtering apparatus. 4,401,546, Cl. 204-298.000.

Nakamura, Makoto; and Hojima, Toshinari, to Nissan Motor Company, Limited. Rocker arm fitting structure. 4,401,064, Cl. 123-90.390.

Nakamura, Masayuki: *See*—
Odaka, Kuniyuki; Yamamura, Yukio; Ishino, Koichi; and Nakamura, Masayuki, 4,401,929, Cl. 318-466.000.

Nakamura, Yoshiaki: *See*—
Kondo, Kazuyoshi; and Nakamura, Yoshiaki, 4,400,964, Cl. 72-265.000.

Nakane, Hisashi; Kanai, Wataru; and Tsuda, Minoru, to Tokyo Ohka Kogyo Co., Ltd. Composition and process for ultra-fine pattern formation. 4,401,745, Cl. 430-197.000.

Nakano, Yoshiyuki: *See*—
Sato, Akihiko; Nakano, Yoshiyuki; and Tanaka, Etsuo, 4,401,380, Cl. 354-246.000.

Nakazawa, Kazuyoshi: *See*—
Arakawa, Masatoshi; and Nakazawa, Kazuyoshi, 4,401,515, Cl. 203-25.000.

Namura, Kiyoshi: *See*—
Hisano, Katsukuni; Ikeuchi, Kazuo; Nishimura, Makoto; Sibaoka, Hazime; Namura, Kiyoshi; Isida, Akira; and Oyabu, Katsumi, 4,401,411, Cl. 416-196.00R.

Nanya, Toshiki: *See*—
Kawabata, Toshiyasu; Tosaka, Hachiro; and Nanya, Toshiki, 4,401,740, Cl. 430-102.000.

Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,401,080, Cl. 123-440.000.

Narimatsu, Akihisa; and Ohkubo, Hiroyuki, to Sony Corporation. Displacement detector having first and second magnetoresistive elements with a bias field at 45° to each element. 4,401,944, Cl. 324-207.000.

Naruse, Kazuhiko: *See*—
Yuasa, Yoshio; and Naruse, Kazuhiko, 4,401,386, Cl. 356-226.000.

Nash, Robert E.: *See*—
Baresh, Joseph M.; Hisey, Elmer; and Nash, Robert E., 4,400,884, Cl. 33-174.0PA.

National Institute for Metallurgy: *See*—
Hancock, Robert D.; and Green, Brian R., 4,401,629, Cl. 423-24.000.

National Instrument Company, Inc.: *See*—
Rosen, Robert; and Bergandy, Wieslaw, 4,401,141, Cl. 141-192.000.

National Research Development Corporation: *See*—
Barlow, Harold E. M., 4,401,363, Cl. 350-96.300.

National Starch And Chemical Corporation: *See*—
Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,401,793, Cl. 525-285.000.

Neat Nap, Incorporated: *See*—
Pelura, Carme D., 4,400,836, Cl. 5-498.000.

Neefe, Charles W. Hydrogel oxygen generator with improved fluid flow. 4,401,371, Cl. 351-160.00R.

Neelameggham, Ramaswami; and Priscu, John C., to AMAX Inc. Magnesium granules coated with fluoride containing flux for desulfurizing steel. 4,401,465, Cl. 75-58.000.

Nehmey, Sam D.; and Summers, James W., to B. F. Goodrich Company, The. Method and apparatus for extruding foam polymeric materials involving the use of an extrusion screw having spaced multiple flight mixing means thereon. 4,401,612, Cl. 264-53.000.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Precision measuring apparatus. 4,400,880, Cl. 33-125.00C.

Nelson, Marvin D.: *See*—
Adams, John T.; and Nelson, Marvin D., 4,401,262, Cl. 236-46.00R.

Nemechek, Marshall E., to Douglas & Lomason Company. Weigh scale machine having solid-state controller. 4,401,174, Cl. 177-114.000.

Neshyba, Valiant J. System for lagtime measurement during drilling. 4,401,169, Cl. 175-42.000.

Nevins, Michael J.: *See*—
Lowell, Jack L.; Nevins, Michael J.; Reid, Kenneth I. G.; and Walter, Kenneth L., 4,401,813, Cl. 536-98.000.

Newton, Anthony D., to Motorola, Inc. Vertical sync counter with automatic recognition of TV line standard. 4,402,011, Cl. 358-154.000.

Newton, Ronald O.; Shute, Bruce W.; and Allen, John J., Jr., to General Signal Corporation. Computerized brake control system. 4,402,047, Cl. 364-426.000.

Ney, Karl F. Method for removing liquids floating on water. 4,401,571, Cl. 210-680.000.

Nichols, Charles S.: *See*—
Miller, Howard A.; and Nichols, Charles S., 4,402,069, Cl. 367-154.000.

Nielsen, Michael J.: *See*—
Buus, Ole; and Nielsen, Michael J., 4,401,889, Cl. 250-328.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Nakamura, Kyuzo; Ohta, Yoshifumi; and Yamada, Taiki, 4,401,546, Cl. 204-298.000.

Niimura, Koichi: *See*—
Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, 4,401,592, Cl. 260-112.00B.

Nikolich, Milovan, to Signode Corporation. Bumperless gun nailer. 4,401,251, Cl. 227-130.000.

Nilsson, Ake: *See*—
Carlstedt, Anders; and Nilsson, Ake, 4,400,957, Cl. 72-8.000.

Nippon Cable System, Inc.: *See*—
Kobayashi, Tetuo; and Hirai, Syoichi, 4,400,993, Cl. 74-501.50R.
Yoshifuji, Junnosuke, 4,401,781, Cl. 524-261.000.

Nippon Electric Co., Ltd.: *See*—
Miyazaki, Togo; and Suehiro, Junichi, 4,401,982, Cl. 340-758.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Ishii, Shinichi; Saino, Tetsushi; and Someno, Tetsuya, 4,401,594, Cl. 260-112.50R.

Nippon Kogaku K. K.: *See*—
Sato, Akihiko; and Magariyama, Kenichi, 4,401,377, Cl. 354-173.000.

Nippon Kogaku K.K.: *See*—
Kimura, Makoto; and Terunuma, Hiroshi, 4,401,374, Cl. 354-25.000.
Sato, Akihiko; Nakano, Yoshiyuki; and Tanaka, Etsuo, 4,401,380, Cl. 354-246.000.

Nippon Soken, Inc.: *See*—
Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.
Kato, Kiyoshi; Kondo, Yasuo; Kuwakado, Satosi; and Kakeno, Nobuhiko, 4,401,078, Cl. 123-376.000.
Miura, Kazuhiko; Kawabata, Takakazu; Hattori, Tadashi; and Ueno, Yoshiki, 4,401,948, Cl. 324-378.000.
Noguchi, Hiroki; and Fukami, Akira, 4,400,845, Cl. 15-250.420.

Nippon Telegraph & Telephone Public Corp.: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimizu, Masao, 4,402,081, Cl. 371-21.000.
Matsuo, Seitaro; Yoshihara, Hideo; and Yamazaki, Shinichi, 4,401,054, Cl. 118-723.000.

Nippon Valqua Kogyo Kabushiki Kaisha: *See*—
Ishii, Eiichi; Mori, Yoshiaki; and Toyoda, Minoru, 4,401,885, Cl. 219-523.000.

Nippondenso Co., Ltd.: *See*—
Miwa, Naoto; and Segawa, Yoshihiro, 4,401,967, Cl. 338-34.000.
Tsuchida, Takashi; Okada, Kazukiyo; Okuda, Yutaka; Kondo, Nobuo; and Shinohara, Toshio, 4,402,048, Cl. 364-442.000.

Nishikawa, Masaji: *See*—
Suzuki, Yoshiro; Yasuda, Tadahiro; Nishikawa, Masaji; Sato, Eiichi; and Aoki, Tadashi, 4,401,383, Cl. 355-3.0TR.

Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. Power steering device for vehicles. 4,401,180, Cl. 180-148.000.

Nishikawa, Yoshiyasu, to Kawasaki Jukogyo Kabushiki Kaisha. Diagonal-flow fan wheel with blades of developable surface shape. 4,401,410, Cl. 416-186.00R.

Nishimura, Makoto: *See*—
Hisano, Katsukuni; Ikeuchi, Kazuo; Nishimura, Makoto; Sibaoka, Hazime; Namura, Kiyoshi; Isida, Akira; and Oyabu, Katsumi, 4,401,411, Cl. 416-196.00R.

Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, to Hitachi, Ltd. Intake air amount detecting system for internal combustion engines. 4,400,974, Cl. 73-118.000.

Nishina, Shuho: *See*—
Kawaguchi, Hiroshi; and Nishina, Shuho, 4,401,347, Cl. 303-6.00C.

Nishiyama, Mitsuru: *See*—
Miyazaki, Takaaki; Hashimoto, Sadakatsu; and Nishiyama, Mitsuru, 4,401,370, Cl. 350-357.000.

Nissan Motor Co., Ltd.: *See*—
Furuhashi, Shoji, 4,401,073, Cl. 123-339.000.
Hayakawa, Nobuo; Ohashi, Yasuo; Ohta, Kenji; Takagi, Yasumasa; and Gotoh, Masami, 4,400,844, Cl. 15-250.160.
Hirabayashi, Hirokazu; Tomioka, Hirotaka; and Yamagata, Shuji, 4,401,341, Cl. 296-185.000.
Horiuchi, Tomofusa; and Yokota, Shoichiro, 4,401,074, Cl. 123-339.000.
Iijima, Tetsuya; and Takahashi, Seiichi, 4,401,149, Cl. 165-2.000.
Ikeura, Kenji, 4,401,087, Cl. 123-492.000.
Ishikawa, Hiroshi; and Satake, Sachio, 4,401,310, Cl. 280-6.100.
Itou, Tomio; and Mizote, Masanori, 4,402,057, Cl. 364-900.000.
Kamijo, Ken; and Nagashima, Hideyuki, 4,401,928, Cl. 318-466.000.
Kimura, Toshimitsu; and Ohmura, Yutaka, 4,401,332, Cl. 293-135.000.
Koriyama, Masayuki; Ohnishi, Kimimasa; and Ishido, Takao, 4,401,139, Cl. 139-435.000.
Miki, Hiroyuki, 4,401,282, Cl. 242-107.40A.
Nakamura, Makoto; and Hojima, Toshinari, 4,401,064, Cl. 123-90.390.
Noso, Kazunori; Yano, Hiroshi; Kishi, Norimasa; and Takeuchi, Yasuhisa, 4,401,852, Cl. 179-1.0VC.
Ohashi, Toshio; Muto, Yoshihiko; and Takasaki, Masaru, 4,401,013, Cl. 98-2.110.

Okuyama, Hiroo; and Matsuoka, Hideoki, 4,401,320, Cl. 280-801.000.
Tsunoda, Masakazu, 4,401,848, Cl. 179-1.0SM.

Nitta, Tsuneo; Murata, Toshitake; Tsuboi, Hiroyuki; and Kondo, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Voice recognition apparatus. 4,401,851, Cl. 179-1.0SD.

Nitto Boseki Co., Ltd.: *See*—
Nomura, Isao; Hori, Masayoshi; Goto, Sotomi; and Kittaka, Hirokazu, 4,401,715, Cl. 428-306.600.

NL Industries Inc.: *See*—
Herman, Daniel F.; and Kruse, Uno, 4,401,795, Cl. 525-327.800.
Lowell, Jack L.; Nevins, Michael J.; Reid, Kenneth I. G.; and Walter, Kenneth L., 4,401,813, Cl. 536-98.000.

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Martin San Lorenzo, Daniel; Regife Vega, Jose M.; and Nogueira, Eduardo D., 4,401,531, Cl. 204-114.000.

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Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.

Nokami, Junzo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Saito, Norio; and Sasaoka, Michio, 4,401,528, Cl. 204-78.000.

Noll, Harry C., Jr., to Harris Corporation. Stacker-tyer. 4,401,021, Cl. 100-14.000.

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Nomura, Yoshiro. Miniature vehicle action toy. 4,400,908, Cl. 46-209.000.

Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr. Method for producing a cartridge for purifying exhaust gas. 4,400,860, Cl. 29-157.00R.

Noorigian, Kenneth C. Electromagnetic trigger switch. 4,401,958, Cl. 335-170.000.

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Nagel, Jens, 4,400,853, Cl. 19-129.00R.

Norsk Hydro a.s.: *See*—
Kongshaug, Gunnar, 4,400,891, Cl. 34-85.000.

North American Philips Corporation: *See*—
Enright, John A.; Ives, Milton N.; and Daniels, Richard H., 4,401,959, Cl. 335-272.000.

Northern Telecom Limited: *See*—
Hope, Tomasz S., 4,401,366, Cl. 350-96.230.

Nose, Dalton: *See*—
Wells, William; and Nose, Dalton, 4,401,466, Cl. 75-60.000.

Noso, Kazunori; Yano, Hiroshi; Kishi, Norimasa; and Takeuchi, Yasuhisa, to Nissan Motor Company, Limited. Voice response control system. 4,401,852, Cl. 179-1.0VC.

Novorsky, Donald E., to Park-Ohio Industries, Inc. Method for inductively heating thin-walled elongated workpieces. 4,401,485, Cl. 148-150.000.

Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Hydrogenation catalysts. 4,401,640, Cl. 423-367.000.

Nowakowski, Tamara: *See*—
Farrington, Thomas A.; and Nowakowski, Tamara, 4,401,574, Cl. 210-728.000.

Nozawa, Ryoichiro; and Matsui, Mitsuo, to Fujitsu Fanuc Limited. Method for carrying out a cutting work in machining using numerical data. 4,402,051, Cl. 364-475.000.

Nozawa, Yoshikuni, to Entac Co., Ltd. Electric motor coil element and method of manufacturing the same. 4,401,907, Cl. 310-203.000.

NSK - Warner KK: *See*—
Morinaga, Masaru, 4,400,857, Cl. 24-230.00A.

NTN Toyo Bearing Co., Ltd.: *See*—
Morishita, Mitsuharu, 4,401,937, Cl. 322-28.000.

N.V. Nederlandse Gasunie: *See*—
Klimstra, Jacob, 4,401,946, Cl. 324-208.000.

Oba, Masayuki: *See*—
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,401,777, Cl. 523-451.000.

Ober, Jurgen: *See*—
Knothe, Erich; Melcher, Franz-Josef; Ober, Jurgen; Sodler, Walter; and Martens, Veronika, 4,401,176, Cl. 177-180.000.

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Occidental Chemical Corporation: *See*—
Duva, Robert; and Mayer, Linda J., 4,401,527, Cl. 204-47.000.
Emmett, John E., 4,401,012, Cl. 92-248.000.
Martin, Sylvia, 4,401,526, Cl. 204-43.00Z.

Occidental Research Corporation: *See*—
Salisbury, Winfield W., 4,401,618, Cl. 376-106.000.

Ochi, Sam S., to Advanced Micro Devices, Inc. Comparator. 4,401,901, Cl. 307-362.000.

Odaka, Kuniyuki; Yamamura, Yukio; Ishino, Koichi; and Nakamura, Masayuki, to Matsushita Electric Works, Ltd. Control apparatus of automatic door. 4,401,929, Cl. 318-466.000.

Odhner, Oliver R.; and Michaud, Joseph W., to Pennwalt Corporation. Low smoke and flame spread cable construction. 4,401,845, Cl. 174-113.00R.

Oehley, Gernot: *See*—
Csaszar, Gabor; Goldman, Fred M.; Oehley, Gernot; and Svoboda, Edward J., 4,401,089, Cl. 123-536.000.

Oetjen, Heinrich: *See*—
Gutermuth, Paul; and Oetjen, Heinrich, 4,401,165, Cl. 169-54.000.

Officine Meccaniche Pavesi & C. S.p.A.: *See*—
Barrera, Giorgio, 4,400,871, Cl. 29-596.000.

Ogawa, Hiroyasu: *See*—
Saito, Kazuhisa; Ogawa, Hiroyasu; and Shigei, Tetsuro, 4,401,533, Cl. 204-130.000.

Ogawa, Hisashi: *See*—
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, 4,401,321, Cl. 280-804.000.

Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, to Hitachi Shipbuilding & Engineering Co., Ltd. Apparatus for granulating coal. 4,401,278, Cl. 241-46.170.

Oguchi, Yoshiharu: *See*—
Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, 4,401,592, Cl. 260-112.00B.

O'Gwynn, David C., to Ampex Corporation. Digital open loop tape tension control circuit for tape recorders and the like. 4,401,923, Cl. 318-6.000.

Ohashi, Toshio; Muto, Yoshihiko; and Takasaki, Masaru, to Nissan Motor Co., Ltd. Air conditioning device. 4,401,013, Cl. 98-2.110.

Ohashi, Yasuo: *See*—
Hayakawa, Nobuo; Ohashi, Yasuo; Ohta, Kenji; Takagi, Yasumasa; and Gotoh, Masami, 4,400,844, Cl. 15-250.160.

Ohberg, Ingemar, to Rockwool Aktiebolaget. Method for manufacture of shaped objects of mineral wool. 4,401,610, Cl. 264-40.400.

Ohe, Takeshi, to Jidosha Kiki Co., Ltd. Hydraulic fluid feeding device for power steering device. 4,400,938, Cl. 60-429.000.

Ohira, Eiji: *See*—
Ichikawa, Akira; Hataoka, Nobuo; Kitazume, Yoshiaki; and Ohira, Eiji, 4,401,849, Cl. 179-1.0SC.

Ohki, Hisashi: *See*—
Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.

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Narimatsu, Akihisa; and Ohkubo, Hiroyuki, 4,401,944, Cl. 324-207.000.

Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,401,993, Cl. 346-76.0PH.

Ohmura, Kaoru; Koyama, Ryohei; and Kimura, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for manufacturing a fine-patterned thick film conductor structure. 4,401,521, Cl. 204-12.000.

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Ohmura, Yutaka: *See*—
Kimura, Toshimitsu; and Ohmura, Yutaka, 4,401,332, Cl. 293-135.000.

Ohnishi, Hiroaki: *See*—
Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.

Ohnishi, Kimimasa: *See*—
Koriyama, Masayuki; Ohnishi, Kimimasa; and Ishido, Takao, 4,401,139, Cl. 139-435.000.

Ohta, Kenji: *See*—
Hayakawa, Nobuo; Ohashi, Yasuo; Ohta, Kenji; Takagi, Yasumasa; and Gotoh, Masami, 4,400,844, Cl. 15-250.160.

Ohta, Yoshifumi: *See*—
Nakamura, Kyuzo; Ohta, Yoshifumi; and Yamada, Taiki, 4,401,546, Cl. 204-298.000.

Ohta, Yoshihiro: *See*—
Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, 4,401,971, Cl. 340-52.00F.

Oide, Kunimasa, to Daichiku Co., Ltd. High-speed disk grindstone and process for producing the same. 4,401,442, Cl. 51-297.000.

Oka, Tatsushi: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, 4,401,757, Cl. 435-71.000.

Okabe, Yukihiro: *See*—
Kaneko, Shoroku; Yamaoka, Sigenori; Mizuno, Masuo; and Okabe, Yukihiro, 4,401,499, Cl. 156-307.300.

Okada, Kazukiyo: *See*—
Tsuchida, Takashi; Okada, Kazukiyo; Okuda, Yutaka; Kondo, Nobuo; and Shinohara, Toshio, 4,402,048, Cl. 364-442.000.

Okada, Tadaaki: *See*—
Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.

Okada, Takashi, to Sony Corporation. Current comparator circuit. 4,401,899, Cl. 307-350.000.

Okamura, Yasushi; and Tanaka, Kiichiro, to Matsushita Electric Industrial Co., Ltd. Stationary record player. 4,402,071, Cl. 369-67.000.

O'Keefe, Patrick J., Jr.; Schubert, Frank R.; and Rini, Guy T., to Bendix Corporation, The. Automatic speed control for heavy vehicles. 4,401,075, Cl. 123-352.000.

Oki Electric Industry Co., Ltd.: *See—*
Isobe, Minoru; and Kikuchi, Hiroshi, 4,401,906, Cl. 310-156.000.

Oki, Hisashi: *See—*
Ito, Sumio; Kumai, Teruo; Oki, Hisashi; and Tanahashi, Toshio, 4,401,072, Cl. 123-292.000.

Okuda, Kyokai: *See—*
Watabe, Tomiji; Kondo, Hideo; Okuda, Kyokai; Yano, Kenji; and Asano, Seiichi, 4,400,940, Cl. 60-502.000.

Okuda, Yutaka: *See—*
Tsuchida, Takashi; Okada, Kazukiyo; Okuda, Yutaka; Kondo, Nobuo; and Shinohara, Toshio, 4,402,048, Cl. 364-442.000.

Okumura, Michitoshi: *See—*
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,401,484, Cl. 148-131.000.

Okuyama, Hiroo; and Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Door for automobile. 4,401,320, Cl. 280-801.000.

Olauson, Lars G.: *See—*
Olson, Torbjorn; Olauson, Lars G.; and Candolin, Carl-Johan, 4,401,510, Cl. 162-19.000.

Olesch, Reinhard G.: *See—*
Rittenbach, Otto E.; and Olesch, Reinhard G., 4,401,980, Cl. 340-666.000.

Olin Corporation: *See—*
Fuzesi, Stephen; and Bayusik, John G., 4,401,772, Cl. 521-167.000.
Gray, Thomas J., 4,401,529, Cl. 204-95.000.
Hance, James C., 4,401,770, Cl. 521-120.000.
Kadija, Igor V.; and Justice, David D., 4,401,519, Cl. 204-11.000.
Wedig, John H.; Babish, John G.; and Davidson, Jeffrey, 4,401,666, Cl. 424-245.000.

Olson, Donald O. Two-piece low volume spray device. 4,401,273, Cl. 239-498.000.

Olson, Torbjorn; Olauson, Lars G.; and Candolin, Carl-Johan, to MoDo-Chemetics AB. Process for heating up wood chips prior to steaming and pulping. 4,401,510, Cl. 162-19.000.

Olympus Optical Co., Ltd.: *See—*
Baba, Kazuo, 4,401,123, Cl. 128-660.000.
Daigaku, Masaaki, 4,401,358, Cl. 339-113.00L.
Ichikawa, Hiroki, 4,401,864, Cl. 200-17.00R.
Kato, Toshikazu, 4,402,024, Cl. 360-96.500.
Maeda, Haruo, 4,401,362, Cl. 350-6.800.
Suzuki, Yoshiro; Yasuda, Tadahiro; Nishikawa, Masaji; Sato, Eiichi; and Aoki, Tadashi, 4,401,383, Cl. 355-3.0TR.

Onoda, Hiroshi: *See—*
Kurachi, Hisao; Ito, Takeo; and Onoda, Hiroshi, 4,401,395, Cl. 400-697.100.

Onoda, Shigeyoshi: *See—*
Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.

Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. High frequency switching circuit. 4,401,902, Cl. 307-415.000.

Opel, Detlef: *See—*
Rodewald, Gerhard; Opel, Detlef; Brausfeld, Walter; Gottling, Helmut; Meyer, Hans-Friedrich; and Moller, Rudolf, 4,401,293, Cl. 251-324.000.

Oplatka, Georg, to BBC Brown, Boveri & Company Limited. Solar thermal power plant. 4,400,946, Cl. 60-641.800.

Organ, William J.: *See—*
Koudstaal, Willem; and Organ, William J., 4,400,910, Cl. 47-84.000.

Oriel, Sharon L.; and Flowers, Jimmy D., to Dow Chemical Company, The. Moisture curing of polymer coating compositions containing isocyanatoalkyl esters of unsaturated carboxylic acids. 4,401,794, Cl. 525-328.200.

Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Glycine - 8 calcitonin. 4,401,593, Cl. 260-112.50T.

O'Rourke, Harold T., to Cooper Industries, Inc. Mass soldering system. 4,401,253, Cl. 228-125.000.

Osborne, John S., to Synfuel (an Indiana limited partnership). In situ oil shale process. 4,401,162, Cl. 166-248.000.

Osborne, Robert L.; Haley, Paul H.; and Jennings, Stephen J., to Westinghouse Electric Corp. Method and apparatus for the automatic diagnosis of system malfunctions. 4,402,054, Cl. 364-554.000.

Osuga, Minoru: *See—*
Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, 4,400,974, Cl. 73-118.000.

Otis Elevator Company: *See—*
Bittar, Joseph, 4,401,190, Cl. 187-29.00R.

Otsuka, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Process for producing semiconductor device. 4,401,506, Cl. 156-612.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Saito, Norio; and Sasaoka, Michio, 4,401,528, Cl. 204-78.000.

Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio control system for internal combustion engines, having air/fuel ratio control function at engine acceleration. 4,401,080, Cl. 123-440.000.

Otto, Josef: *See—*
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Otto, Neil C.; Warner, Barry T.; Smaga, John A.; and Battles, James E., to United States of America, Energy. Corrosion resistant positive electrode for high-temperature, secondary electrochemical cell. 4,401,714, Cl. 429-221.000.

Owen, Wells P.: *See—*
Simmonds, Richard S.; and Owen, Wells P., 4,401,652, Cl. 424-101.000.

Owens, Carl H. Crimping collet. 4,400,967, Cl. 72-402.000.

Owens-Corning Fiberglas Corporation: *See—*
Eisenberg, Arnold J., 4,401,452, Cl. 65-2.000.
Grover, Raymond H., 4,401,924, Cl. 318-6.000.
McGarry, Dennis L.; and Roehrig, Frederick K., 4,401,609, Cl. 264-11.000.
Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., 4,401,453, Cl. 65-27.000.

Owens, William J.: *See—*
Royal, John H.; Graczyk, Lawrence S.; and Owens, William J., 4,401,155, Cl. 165-166.000.

Oyabu, Katsumi: *See—*
Hisano, Katsukuni; Ikeuchi, Kazuo; Nishimura, Makoto; Sibaoka, Hazime; Namura, Kiyoshi; Isida, Akira; and Oyabu, Katsumi, 4,401,411, Cl. 416-196.00R.

Oyama, Yoshishige: *See—*
Nishimura, Yutaka; Oyama, Yoshishige; Kirisawa, Tadashi; Kuroiwa, Hiroshi; Osuga, Minoru; and Mouri, Yasunori, 4,400,974, Cl. 73-118.000.

OYO Instruments, Inc.: *See—*
Parker, Carl E., 4,400,861, Cl. 29-173.000.

Ozawa, Hiroshi: *See—*
Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, 4,401,971, Cl. 340-52.00F.

Ozawa, Kazunori; Kawana, Takahiro; Seki, Nakaharu; and Komada, Naoya, to Sony Corporation. Magnetic recording medium. 4,401,725, Cl. 428-457.000.

Ozawa, Keiji: *See—*
Wada, Yoshiyo; Kinjo, Hisao; Ozawa, Keiji; Tatsuguchi, Kazuo; Goto, Kunio; and Hirata, Atsumi, 4,402,018, Cl. 358-342.000.

Pace, Wilson D.: *See—*
Jarrett, Robert B.; and Pace, Wilson D., 4,401,974, Cl. 340-347.0AD.

Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., to Eli Lilly and Company. Carbonyl-substituted 1-sulfonylbenzimidazoles. 4,401,817, Cl. 548-136.000.

Paglia, Richard: *See—*
Reynard, John M.; Carignan, Thomas N.; Paglia, Richard; and Rich, Joseph R., 4,401,858, Cl. 179-111.00R.

Palm, Bernhard, to Milwaukee Electric Tool Corporation. Spindle lock with impacting capability. 4,400,995, Cl. 74-527.000.

Palmbos, Allen L.: *See—*
Kulikowski, Patricia A.; Palmbos, Allen L.; and Tyke, Charles R., 4,401,222, Cl. 211-94.000.

Pampalone, Thomas R.; and Seffren, Sidney S., to RCA Corporation. Epoxy encapsulating formulation. 4,401,775, Cl. 523-403.000.

Paquet Thermique, S.A.: *See—*
Charrier, Elie; and Fourno, Rene, 4,401,058, Cl. 122-17.000.

Parant, Monique: *See—*
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, 4,401,659, Cl. 424-177.000.

Park, Chan H.: *See—*
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,401,108, Cl. 128-1.100.

Park-Ohio Industries, Inc.: *See—*
Novorsky, Donald E., 4,401,485, Cl. 148-150.000.
Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., 4,401,486, Cl. 148-154.000.

Parker, Bruce H. Automated trash collection receptacle. 4,401,312, Cl. 280-47.170.

Parker, Carl E., to OYO Instruments, Inc. Fabrication of seismic springs from sheets. 4,400,861, Cl. 29-173.000.

Parker, John W.; and Auer, John H., Jr., to Du Pont de Nemours, E. I., and Company. Polarity sensitive solid state relay. 4,402,034, Cl. 361-208.000.

Parmenon, Daniel: *See—*
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Parodi, Sandro: *See—*
Albizzati, Enrico; Bassi, Ivano; Foschini, Giorgio; Parodi, Sandro; and Pirinoli, Franco, 4,401,641, Cl. 423-498.000.

Parrott, Richard A.: *See—*
Koza, Francis R.; and Parrott, Richard A., 4,401,913, Cl. 313-25.000.

Pasilac A/S: *See—*
Rubin, Jan; and Bjerre, Poul, 4,401,679, Cl. 426-36.000.

Paskarbeit, Edgar; and Scholer, Horst D., to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Electric smelting furnace and associated charging equipment and bins. 4,402,083, Cl. 373-79.000.

Patchett, Arthur A.; and Taub, David, to Merck & Co., Inc. Novel α-amino acids. 4,401,676, Cl. 424-309.000.

Patrone, Alberto: *See—*
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, 4,401,573, Cl. 210-724.000.

Paul, Thomas R., to Standard Oil Company (Indiana). Nonwoven fabric and method of bonding same using microwave energy and a polar solvent. 4,401,708, Cl. 428-198.000.
Pavincic, Ivan. Footrest for two-wheeled engine driven vehicles and bicycles. 4,401,315, Cl. 280-259.000.
Pavlo, John A.: *See*—
Taylor, Rebecca S.; and Pavlo, John A., 4,401,125, Cl. 128-715.000.
Payne, Frank, to Robertshaw Controls Company. Combined temperature responsive valve construction and electrical switch construction and method of making the same. 4,401,964, Cl. 337-343.000.
Pearl, David R.: *See*—
Gerber, Heinz J.; and Pearl, David R., 4,401,001, Cl. 83-451.000.
Pedain, Josef; Thoma, Wilhelm; Grammel, Jurgen; and Schroer, Walter, to Bayer Aktiengesellschaft. Coating and dressing agents for leather and leather substitutes based on polyurethane urea coating compounds. 4,401,801, Cl. 528-67.000.
Pedroia, Luigi. Machine for automatically tying knots in meat stuffed in a casing by means of a string. 4,401,329, Cl. 289-18.100.
Peebles, Russell H.: *See*—
Krantz, Emerson H.; and Peebles, Russell H., 4,400,913, Cl. 49-352.000.
Pehr, Harold T. Tamper indicating closure cap. 4,401,227, Cl. 215-252.000.
Peik, Jerry A.; Steenbergen, Suzanna M.; and Hayden, Harold R., to Merck & Co., Inc. Heteropolysaccharide S-194. 4,401,760, Cl. 435-101.000.
Pellet, Regis J.; Bertolacini, Ralph J.; and Lysholm, Donna L., to Standard Oil Company (Indiana). Reforming with an improved platinum-containing catalyst. 4,401,558, Cl. 208-139.000.
Pelura, Carme D., to Neat Nap, Incorporated. Method for fitting bed sheets. 4,400,836, Cl. 5-498.000.
Pennwalt Corporation: *See*—
Odhner, Oliver R.; and Michaud, Joseph W., 4,401,845, Cl. 174-113.00R.
Penzien, Klaus: *See*—
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, 4,401,545, Cl. 204-291.000.
Perino, Didier: *See*—
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Perkins, David J. B.: *See*—
Bailey, George K.; Holroyd, Eric; Wright, Anthony R.; and Perkins, David J. B., 4,401,493, Cl. 156-117.000.
Pernicano, Vincent S.; and Wright, Michael R. Reflective garment and method of manufacturing same. 4,401,494, Cl. 156-155.000.
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, to Luigi Stoppani S.p.A. Continuous process for the removal of chromium from waste waters and valorization of the recovered chromium. 4,401,573, Cl. 210-724.000.
Peters, C. Martin. Label reader and system. 4,401,892, Cl. 250-566.000.
Petersen, Richard W.: *See*—
McDevitt, John E., Jr.; and Petersen, Richard W., 4,401,353, Cl. 339-18.00C.
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., to United States of America, Agriculture. Mechanical buncher for leafy vegetables. 4,400,983, Cl. 74-25.000.
Peterson, Wesley R., to Singer Company, The. Double pointed looper actuating mechanism for chain stitch sewing machine. 4,401,043, Cl. 112-199.000.
Petitou, Maurice: *See*—
Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, 4,401,662, Cl. 424-183.000.
Lormeau, Jean-Claude; Choay, Jean; and Petitou, Maurice, 4,401,758, Cl. 435-84.000.
Petkovsek, Dennis W., to Reliance Electric Company. Supply for providing uninterruptible d-c power to a load. 4,401,895, Cl. 307-66.000.
Petrocarbon Developments Limited: *See*—
Ruhemann, Martin S. W., 4,400,947, Cl. 60-648.000.
Petzow, Gunter: *See*—
Claussen, Nils; and Petzow, Gunter, 4,401,729, Cl. 428-623.000.
Peyton, Richard H.; and Thornton, Donald I., to Fram Corporation. Fluid filter. 4,400,864, Cl. 29-508.000.
Pfingston, William J., to Polaroid Corporation. Stripping layer consisting of a mixture of cellulose acetate hydrogen phthalate and straight chain saturated polyester of adipic acid. 4,401,746, Cl. 430-215.000.
Pfrommer, Arthur M. Breast prosthesis and method of making the same. 4,401,492, Cl. 156-61.000.
Phillips, John S.: *See*—
Kennon, Jerry M.; and Phillips, John S., 4,402,059, Cl. 364-900.000.
Phillips Petroleum Company: *See*—
Casperson, John R., 4,401,402, Cl. 414-218.000.
Lee, Fu-Ming, 4,401,517, Cl. 203-53.000.
Lewis, Robert J., 4,401,626, Cl. 422-151.000.
Likins, Merle R., Jr., 4,401,512, Cl. 196-132.000.
MacDonell, Gary D.; and Stacy, Carl J., 4,401,535, Cl. 204-158.00R.
Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., 4,401,640, Cl. 423-367.000.
Photowatt International, Inc.: *See*—
Chitre, Sanjeev R., 4,401,840, Cl. 136-258.000.
Piechota, Stanley E., Jr., to Colgate-Palmolive Company. Dental cream composition. 4,401,648, Cl. 424-49.000.
Pierrel, Michel; and Mertzweiller, Guy, to Pont-a-Mousson S.A. Process for the handling and heat treatment of cast iron or steel pipes and tubes. 4,401,478, Cl. 148-15.000.
Pieterick, Jerome A.: *See*—
Merton, Wilfred R.; and Pieterick, Jerome A., 4,401,272, Cl. 239-337.000.
Pillman, Harry F.; and Recknagel, H. Carl, to Illinois Tool Works Inc. Multiple container carrier and package. 4,401,211, Cl. 206-150.000.
Pinnolis, Samuel: *See*—
Craver, Edward H.; and Pinnolis, Samuel, 4,400,874, Cl. 29-861.000.
Pirinoli, Franco: *See*—
Albizzati, Enrico; Bassi, Ivano; Foschini, Giorgio; Parodi, Sandro; and Pirinoli, Franco, 4,401,641, Cl. 423-498.000.
Pitel, Irving: *See*—
Baldwin, Wilbur A.; Silverman, Richard; Jezorek, Leigh; and Pitel, Irving, 4,401,003, Cl. 83-483.000.
Pitney Bowes Inc.: *See*—
Buan, Danilo P., 4,401,031, Cl. 101-363.000.
Chiang, Albert C., 4,401,742, Cl. 430-137.000.
Pizziconi, Vincent B.: *See*—
Dorson, William J., Jr.; and Pizziconi, Vincent B., 4,401,430, Cl. 604-4.000.
Placke, James E.: *See*—
Foster, John R.; and Placke, James E., 4,401,330, Cl. 292-300.000.
Plaserco S.A.: *See*—
Bove, Fred, 4,400,906, Cl. 46-21.000.
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 3-Aryl-5-methylpyrazole-4-carboxylic acid esters. 4,401,821, Cl. 548-374.000.
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, to Mannesmann DeMag AG. Electro-metal smelting furnace with taphole arranged at the bottom. 4,401,296, Cl. 266-236.000.
Podrapsky, Jiri, to Robert Bosch GmbH. Magneto ignition system for an internal combustion engine. 4,401,096, Cl. 123-631.000.
Poetschke, Leonard E.; and Zeitz, Vernon, to Scotia Recovery Systems Limited. Apparatus for manufacturing and stabilizing coal-oil-water fuel mixture. 4,401,437, Cl. 44-2.000.
Poignant, Robert E.: *See*—
Braun, Arthur R.; and Poignant, Robert E., 4,401,861, Cl. 179-175.30R.
Polaroid Corporation: *See*—
Cocco, Vincent L., 4,401,381, Cl. 354-303.000.
Green, Milton, 4,401,649, Cl. 424-60.000.
Kisler, Semyon, 4,402,035, Cl. 361-213.000.
Pfingston, William J., 4,401,746, Cl. 430-215.000.
Reynard, John M.; Carignan, Thomas N.; Paglia, Richard; and Rich, Joseph R., 4,401,858, Cl. 179-111.00R.
Pollman, Frederic W., to Sundstrand Corporation. Variable displacement hydraulic drive with disconnect. 4,401,182, Cl. 180-242.000.
Pomazi, Laszlo. Film design and improved circuit therefor enabling utilization of greater film exposure area. 4,401,376, Cl. 354-173.000.
Pomponi, Edward A., Jr., to Binks Manufacturing Company. Spray gun with paint agitator. 4,401,268, Cl. 239-142.000.
Pond, C. Ray; and Wilbert, Reynold E., to Boeing Company, The. Electromagnetic beam acquisition and tracking system. 4,401,886, Cl. 250-203.00R.
Pont-a-Mousson S.A.: *See*—
Pierrel, Michel; and Mertzweiller, Guy, 4,401,478, Cl. 148-15.000.
Porrmann, Herbert; Siefried, Walter; Klenk, Ludwig; and Stenger, Karl, to Hoechst Aktiengesellschaft. Tubular casing, process for its manufacture, and its use as a sausage casing. 4,401,136, Cl. 138-118.100.
Porta Systems Corp.: *See*—
Fasano, Michael, 4,402,031, Cl. 361-124.000.
Portmann, Robert, to Ciba-Geigy Corporation. Certain 3-phenylhydrazono-2-amino-1,1,3-propene tricarbonitrile. 4,401,600, Cl. 260-465.00E.
Portoghese, Philip S., to University of Minnesota, Regents of the. Non-addictive narcotic antitussive preparation. 4,401,672, Cl. 424-260.000.
Pospisil, Robert S., to Harris Corporation. Voltage equalizer bridge. 4,401,940, Cl. 323-365.000.
Post, Kendall E.: *See*—
Curtin, William J.; Henning, Paul N.; and Post, Kendall E., 4,401,856, Cl. 179-27.0FH.
Power Transmssion Technology, Inc.: *See*—
Heidenreich, David C., 4,401,426, Cl. 464-41.000.
Pozsicsanyi, Wolfgang, to Wilhelm Gebhardt GmbH. Device for pumping a liquid or gaseous current medium. 4,401,151, Cl. 165-86.000.
PPG Industries, Inc.: *See*—
Donley, Harold E., 4,401,474, Cl. 106-243.000.
Greenberg, Charles B., 4,401,690, Cl. 427-87.000.
Krass, Dennis K., 4,401,602, Cl. 260-465.00E.
Roseman, Michael P.; Eames, Richard C.; and Barrett, Marlin W., 4,401,204, Cl. 198-431.000.
Sopko, John F., 4,401,695, Cl. 427-180.000.
Prabhu, Ashok N.; and Hang, Kenneth W., to RCA Corporation. Overglaze inks. 4,401,709, Cl. 428-209.000.
Priel, Ury: *See*—
Moss, William E.; Waser, Shlomo; and Priel, Ury, 4,402,067, Cl. 365-219.000.

Prinz, Bruno; Rockel, Manfred B.; Rudolph, Gunther; Heubner, Ulrich; and Zoebe, Hugo, to Vereinigte Deutsch Metallwerke AG. Gold-colored coin material. 4,401,488, Cl. 148-435.000.

Priscu, John C.: *See*—
Neelameggham, Ramaswami; and Priscu, John C., 4,401,465, Cl. 75-58.000.

Procter & Gamble Company, The: *See*—
Buckwalter, Brian L.; and LaHann, Thomas R., 4,401,663, Cl. 424-321.000.
Verbruggen, Martin W., 4,401,578, Cl. 252-8.800.

Professional Products, Inc.: *See*—
Weisner, Daniel M., 4,401,894, Cl. 307-64.000.

Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., to Owens-Corning Fiberglas Corporation. Preheating glass batch. 4,401,453, Cl. 65-27.000.

Protective Treatments, Inc.: *See*—
Wolters, Dennis R., 4,401,701, Cl. 428-31.000.

PTX-Pentronix, Inc.: *See*—
DeSantis, Raymond P., 4,401,614, Cl. 264-109.000.

Puccini, Sergio E.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,402,077, Cl. 370-63.000.

PureCycle Corporation: *See*—
Blades, Frederick K., 4,400,976, Cl. 73-290.00V.

Purins, Egils A.: *See*—
Gates, Freeman C., Jr.; and Purins, Egils A., 4,401,093, Cl. 123-573.000.

Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., to Park-Ohio Industries, Inc. Method for annealing work hardened portions of structural beams. 4,401,486, Cl. 148-154.000.

Pyle, Bruce D., to Atlantic Richfield Company. Solar panel with hardened foil back layer. 4,401,839, Cl. 136-251.000.

Quentron, Inc.: *See*—
West, Richard D.; and West, Donald O., 4,401,888, Cl. 250-231.00R.

Quick, Nathaniel R. Apparatus and method for processing wire stand cable for use in prestressed concrete structures. 4,401,479, Cl. 148-6.350.

Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., to Rockwell International Corporation. Method and apparatus for an optical sensor utilizing semiconductor filters. 4,401,694, Cl. 427-162.000.

Rabe, Erich, to Electrolux Siegen GmbH. Motor-compressor. 4,401,419, Cl. 417-415.000.

Rabo, Jule A.: *See*—
Bezman, Richard D.; and Rabo, Jule A., 4,401,556, Cl. 208-111.000.

Rachedi, Shane H., to Ford Motor Company. Exhaust gas recirculation system. 4,401,092, Cl. 123-568.000.

Rakes, James M.: *See*—
Kulterman, Robert W.; Rakes, James M.; and Sweat, Robert H., Jr., 4,401,931, Cl. 318-696.000.

Ralston Purina Company: *See*—
Cody, Joe C.; and Rettke, Curt, 4,401,056, Cl. 119-18.000.

Ramage, John G.: *See*—
Davy, John C.; Fenton, Brian P.; and Ramage, John G., 4,401,933, Cl. 318-778.000.

Ramirez, Eleazar F.: *See*—
Mattis, John S.; Ramirez, Eleazar F.; and Vrcelj, Michael J., 4,401,842, Cl. 174-71.00R.

Ramsch, Gerhard: *See*—
Komossa, Werner; and Ramsch, Gerhard, 4,401,205, Cl. 198-524.000.

Rasco Incorporated: *See*—
Schwaikert, Ralph A., 4,401,225, Cl. 215-211.000.

Rathjens, Dieter; and Schone, Gerhard, to Licentia Patent-Verwaltungs-GmbH. Method and apparatus for enhancing an incomplete, limited bandwidth picture generated by an image sensor. 4,402,009, Cl. 358-125.000.

Rattner, Justin R.: *See*—
Cox, George W.; and Rattner, Justin R., 4,402,046, Cl. 364-200.000.

Ratzker, Herman B. Reciprocating drawer type package vending machine for dispensing vertical banks of packages. 4,401,235, Cl. 221-107.000.

Rauch, Jeffrey S., to Mechanical Technology Incorporated. Vibration absorber for a free piston Stirling engine. 4,400,941, Cl. 60-520.000.

Raudenbusch, Werner T.: *See*—
Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,401,774, Cl. 523-402.000.

Ravinet, Pierre; and Micheron, Francois, to Thomson-CSF. Active suspension piezoelectric polymer transducer. 4,401,911, Cl. 310-800.000.

Ray-Chaudhuri, Dilip K.: *See*—
Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,401,793, Cl. 525-285.000.

Raychem Corporation: *See*—
Mattis, John S.; Ramirez, Eleazar F.; and Vrcelj, Michael J., 4,401,842, Cl. 174-71.00R.

Rayovac Corporation: *See*—
Joshi, Ashok V., 4,401,737, Cl. 429-218.000.

Raytheon Company: *See*—
Evett, Ronald C., 4,402,040, Cl. 364-200.000.

RCA Corporation: *See*—
Ban, Vladimir S., 4,401,689, Cl. 427-45.100.
Guarracini, Joseph; and Walentine, Joseph L., 4,402,072, Cl. 369-132.000.
Knight, Stanley P.; and Henderson, John G. N., 4,402,089, Cl. 455-186.000.
Lewis, Henry G., Jr., 4,402,005, Cl. 358-28.000.
Pampalone, Thomas R.; and Seffren, Sidney S., 4,401,775, Cl. 523-403.000.
Prabhu, Ashok N.; and Hang, Kenneth W., 4,401,709, Cl. 428-209.000.
Ritt, Peter M., 4,401,508, Cl. 156-659.100.
Wargo, Robert A., 4,402,013, Cl. 358-160.000.
Yorinks, Leonard H.; and Milton, Curtis E., Jr., 4,401,955, Cl. 333-127.000.
Young, William C., 4,401,355, Cl. 339-147.00R.

Reading & Bates Construction Co.: *See*—
Cherrington, Martin D., 4,401,170, Cl. 175-73.000.

Recknagel, H. Carl: *See*—
Pillman, Harry F.; and Recknagel, H. Carl, 4,401,211, Cl. 206-150.000.

Recognition Equipment Incorporated: *See*—
McWaters, Lynn D.; and Sanner, Medford D., 4,402,088, Cl. 382-68.000.

Record, Grant C., to Advant Corporation. Expandable card cage. 4,401,351, Cl. 339-17.0LM.

Reeder, James R.: *See*—
Lloyd, Raymond A.; Charles, Larry L.; Susie, William F.; Tate, Allen W., Jr.; and Reeder, James R., 4,402,055, Cl. 364-579.000.

Reenstierna, Bertil. Endocardial, implantable lead for pacemaker. 4,401,126, Cl. 178-784.000.

Reese, Stanton L. Plant protector with heat sink and pesticide packet. 4,400,909, Cl. 47-2.000.

Refojo, Miguel F.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,401,372, Cl. 351-160.00H.

Refractory Products Co.: *See*—
Abell, R. Bruce; and Woodruff, Richard K., 4,401,613, Cl. 264-108.000.

Refrigeration Engineering Corporation: *See*—
Martin, Walter H.; and Briley, George C., 4,401,449, Cl. 62-59.000.

Regife Vega, Jose M.: *See*—
Martin San Lorenzo, Daniel; Regife Vega, Jose M.; and Nogueira, Eduardo D., 4,401,531, Cl. 204-114.000.

Rehder, John E., to Microdot Inc. Manufacturing cast iron with prereduced iron ore pellets. 4,401,469, Cl. 75-130.00R.

Reibel, Robert H.: *See*—
Martinez, Eugene E., 4,400,899, Cl. 40-391.000.

Reid, Kenneth I. G.: *See*—
Lowell, Jack L.; Nevins, Michael J.; Reid, Kenneth I. G.; and Walter, Kenneth L., 4,401,813, Cl. 536-98.000.

Reigner, Gerard; and Breger, Yves, to Europe Outillage S.A. Extruder for the formation of a branch on a pipe. 4,400,959, Cl. 72-112.000.

Reihs, Leonhard: *See*—
ter Jung, Hermann; Reihs, Leonhard; and Roh, Gerhard, 4,401,790, Cl. 525-62.000.

Reinartz, Hans-Dieter; and Thiel, Rudolf, to ITT Industries, Inc. Method of connecting a master brake cylinder to a brake booster and the assembly resulting from this method. 4,400,942, Cl. 60-547.100.

Reinhall, Ulf, to Sunds Defibrator, Inc. Disc-type pulp refining apparatus. 4,401,280, Cl. 241-247.000.

Reinhardt, Victor S.: *See*—
Adams, William A.; and Reinhardt, Victor S., 4,401,953, Cl. 330-289.000.

Reliance Electric Company: *See*—
Petkovsek, Dennis W., 4,401,895, Cl. 307-66.000.

Remington Arms Company, Inc.: *See*—
Albin, Scott R., 4,401,032, Cl. 101-363.000.

Remson, Donald R., to Western Services International, Inc. Support structure for mudline suspension wellhead. 4,401,398, Cl. 405-201.000.

Renaudin, Jean-Pierre: *See*—
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,401,451, Cl. 65-1.000.

Renault Vehicules Industriels: *See*—
Morin, Rene, 4,401,088, Cl. 123-502.000.

Renz, Klaus, to Siemens Aktiengesellschaft. Monitoring system for a capacitor battery in an AC voltage network. 4,401,942, Cl. 324-60.00C.

Republic Steel Corporation: *See*—
Avellone, Richard C., 4,401,523, Cl. 204-15.000.

Respiratory Care, Inc.: *See*—
Cruz, Exequiel D., 4,401,241, Cl. 222-527.000.

Retech, Inc.: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,401,875, Cl. 219-69.00V.

Rettke, Curt: *See*—
Cody, Joe C.; and Rettke, Curt, 4,401,056, Cl. 119-18.000.

Reuter, Wolfgang: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,401,667, Cl. 424-246.000.

Rex Industries Co., Ltd.: *See*—
Sakaguchi, Ryo; and Ikenaka, Yoshiharu, 4,401,308, Cl. 279-114.000.

Rex, Roger F., to DCI Marketing. Holder for credit card purchase form. 4,401,323, Cl. 281-45.000.

Reynard, John M.; Carignan, Thomas N.; Paglia, Richard; and Rich, Joseph R., to Polaroid Corporation. Method for controlling wrinkles in a vibratile diaphragm. 4,401,858, Cl. 179-111.00R.

Rezaian, Seyed M. Spinal fixator. 4,401,112, Cl. 128-92.00B.

Rheinmagnet Horst Baermann KG: *See*—
Baermann, Horst; and Dibos, Otmar, 4,401,961, Cl. 335-285.000.

Rhodes, Buck A.; and Torvestad, David, to University Patents Inc. Method and apparatus for purifying materials radiolabeled with technetium-99m. 4,401,646, Cl. 424-1.000.

Rhone-Poulenc Agrochimie: *See*—
Giacobbe, Thomas J.; and Tsien, Grace, 4,401,623, Cl. 422-1.000.

Rhone-Poulenc Sante: *See*—
Bouchaudon, Jean; Dutruc-Rosset, Gilles; Farge, Daniel; and James, Claude, 4,401,658, Cl. 424-177.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Cordier, Georges; and Leroux, Patrick, 4,401,819, Cl. 546-252.000.

Rhyme, Fred: *See*—
Alter, Bernard; and Rhyme, Fred, 4,400,907, Cl. 46-32.000.

Rich, Joseph R.: *See*—
Reynard, John M.; Carignan, Thomas N.; Paglia, Richard; and Rich, Joseph R., 4,401,858, Cl. 179-111.00R.

Richmond, James M., to Akzona Incorporated. Quaternary ammonium dihydroborates in fabric softener formulations. 4,401,577, Cl. 252-8.800.

Richter, Jutta M. Bath support. 4,400,835, Cl. 4-578.000.

Richter, Peter: *See*—
Hoffmann, Gerhard; and Richter, Peter, 4,401,749, Cl. 430-271.000.

Ricoh Company, Ltd.: *See*—
Kawabata, Toshiyasu; Tosaka, Hachiro; and Nanya, Toshiki, 4,401,740, Cl. 430-102.000.

Rieder, Werner, to Isovolta Osterreiche Isolierstoffwerk Aktiengesellschaft. Process for the preparation of aromatic polyesters. 4,401,803, Cl. 528-176.000.

Rietz, Peter W. Glove arrangement for water skiing. 4,400,831, Cl. 2-161.00A.

Rigging International Maintenance Co.: *See*—
Simmons, Donald E.; Barker, Raymond H., Jr.; and Walter, Kenneth D., 4,401,337, Cl. 294-81.0SF.

Riley, Thomas J. Coating fixture. 4,401,053, Cl. 118-721.000.

Rini, Guy T.: *See*—
O'Keefe, Patrick J., Jr.; Schubert, Frank R.; and Rini, Guy T., 4,401,075, Cl. 123-352.000.

Rinke, Donald F.: *See*—
Ankrapp, John H.; Holzen, Donald J.; and Rinke, Donald F., 4,401,340, Cl. 296-93.000.

Rios, Roberto. Air deflector for vehicles. 4,401,339, Cl. 296-1.00S.

Ritt, Peter M., to RCA Corporation. Method for removing insolubilized PVA from the surface of a body. 4,401,508, Cl. 156-659.100.

Rittenbach, Otto E.; and Olesch, Reinhard G., to United States of America, Army. Constant current electronic intruder detection system. 4,401,980, Cl. 340-666.000.

Robert Bosch GmbH: *See*—
Brand, Gunter; Gerber, Richard; Ehrmann, Karl; Kaufmann, Reinhold; and Kalippke, Harald, 4,401,066, Cl. 123-146.50A.
Leblanc, Jean, 4,401,082, Cl. 123-447.000.
Leblanc, Jean, 4,401,083, Cl. 123-449.000.
Podrapsky, Jiri, 4,401,096, Cl. 123-631.000.
Wessel, Wolf; and Buck, Rainer, 4,401,081, Cl. 123-443.000.

Roberts, Patricia M.: *See*—
Baxter, Andrew J. G.; Roberts, Patricia M.; and Southgate, Robert, 4,401,595, Cl. 260-239.00A.

Robertshaw Controls Company: *See*—
Crowson, James A., 4,401,263, Cl. 236-84.000.
Payne, Frank, 4,401,964, Cl. 337-343.000.

Rocheleau, Richard E.: *See*—
Baron, Bill N.; Rocheleau, Richard E.; and Russell, T. W. Fraser, 4,401,052, Cl. 118-718.000.

Rockel, Manfred B.: *See*—
Prinz, Bruno; Rockel, Manfred B.; Rudolph, Gunther; Heubner, Ulrich; and Zoebe, Hugo, 4,401,488, Cl. 148-435.000.

Rockwell International Corporation: *See*—
Bohla, David J.; and Elliott, Leonard R., 4,401,197, Cl. 188-334.000.
McEdwards, James A., 4,401,619, Cl. 376-206.000.
Morgan, Peter E. D., 4,401,768, Cl. 501-98.000.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,401,694, Cl. 427-162.000.

Rockwool Aktiebolaget: *See*—
Ohberg, Ingemar, 4,401,610, Cl. 264-40.400.

Rodewald, Gerhard; Opel, Detlef; Brausfeld, Walter; Gottling, Helmut; Meyer, Hans-Friedrich; and Moller, Rudolf, to WABCO Steuerungstechnik GmbH. Arrangement of fluid pressure passageways in cylinder devices. 4,401,293, Cl. 251-324.000.

Rodgers, Stephen D. Antifouling tile containing antifoulant reservoirs for in situ replenishment. 4,401,703, Cl. 428-72.000.

Rodler, Hans, to Somartec S.A., Firma. Device for treatment with interference currents. 4,401,121, Cl. 128-420.00A.

Rods and Cones, Inc.: *See*—
Salmond, Andrea; St. John, Patricia; Luebke, Randall A.; and Van Tassel, Jeffrey B., 4,401,209, Cl. 206-5.000.

Roehrig, Frederick K.: *See*—
McGarry, Dennis L.; and Roehrig, Frederick K., 4,401,609, Cl. 264-11.000.

Roelofs, Hendrik: *See*—
Wesselink, Gustaaf A.; Roelofs, Hendrik; and Van Bommel, Cornelis H. M., 4,401,914, Cl. 313-111.000.

Roen, Richard A., to RSR Systems, Inc. Consumable arc welding torch. 4,401,878, Cl. 219-137.310.

Rogers Corporation: *See*—
Harper, William P.; and DeVries, Donald H., 4,401,843, Cl. 174-72.00B.

Rogers, Robert C. Portable boat hull scrubber. 4,401,048, Cl. 114-222.000.

Roh, Gerhard: *See*—
ter Jung, Hermann; Reihs, Leonhard; and Roh, Gerhard, 4,401,790, Cl. 525-62.000.

Rohm and Haas Company: *See*—
Tanger, Charles M., 4,401,828, Cl. 560-21.000.
Wilson, Harold F.; and Fleischfresser, Marvin H., 4,401,461, Cl. 71-121.000.

Rohr, Wolfgang: *See*—
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,401,821, Cl. 548-374.000.

Romero, Hector G., Jr.: *See*—
McVey, James M.; Romero, Hector G., Jr.; and Wagoner, James D., 4,401,985, Cl. 340-799.000.

Ronbeck, Arne I., to AB Volvo. Handling mechanism for a rectilinear movement with connecting perpendicular movement segments at the ends. 4,400,984, Cl. 74-103.000.

Ronndahl, Sylve: *See*—
Eriksson, Hans; and Ronndahl, Sylve, 4,401,475, Cl. 134-6.000.

Roseliep, Robert E. Method and apparatus for broaching. 4,401,401, Cl. 409-244.000.

Roseman, Michael P.; Eames, Richard C.; and Barrett, Marlin W., to PPG Industries, Inc. Assembly system for loading glass sheets of different size on a conveyor. 4,401,204, Cl. 198-431.000.

Rosen, Bruce I., to UOP Inc. Preparation of carbonyl cyanide. 4,401,639, Cl. 423-365.000.

Rosen, Robert; and Bergandy, Wieslaw, to National Instrument Company, Inc. Filling machine. 4,401,141, Cl. 141-192.000.

Rosler, Richard S.; and Engle, George M., to Advanced Semiconductor Materials America. Plasma deposition of silicon. 4,401,687, Cl. 427-38.000.

Roto Form Sales Corp.: *See*—
Baldwin, Wilbur A.; Silverman, Richard; Jezorek, Leigh; and Pitel, Irving, 4,401,003, Cl. 83-483.000.

Roussel Uclaf: *See*—
Barton, Derek H.; Motherwell, William B.; and Zard Zard, Samir, 4,401,596, Cl. 260-239.550.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,401,601, Cl. 260-464.000.
Martel, Jacques; Tessier, Jean; and Girault, Pierre, 4,401,673, Cl. 424-263.000.

Rovira, Miguel. Remote three axis cable transport system. 4,401,406, Cl. 414-589.000.

Royal, John H.; Graczyk, Lawrence S.; and Owens, William J., to Union Carbide Corporation. Heat exchanger with extruded flow channels. 4,401,155, Cl. 165-166.000.

RSR Systems, Inc.: *See*—
Roen, Richard A., 4,401,878, Cl. 219-137.310.

Rubin, Harvey; and Tullis, Richard H. Detection and isolation of glucagon mRNA using a synthetic oligodeoxynucleotide. 4,401,759, Cl. 435-91.000.

Rubin, Jan; and Bjerre, Poul, to Pasilac A/S. Process for preparing cheese-base. 4,401,679, Cl. 426-36.000.

Ruckert, Hans: *See*—
Steppan, Hartmut; Wildenhain, Barbara; and Ruckert, Hans, 4,401,520, Cl. 204-11.000.

Rudolph, Gunther: *See*—
Prinz, Bruno; Rockel, Manfred B.; Rudolph, Gunther; Heubner, Ulrich; and Zoebe, Hugo, 4,401,488, Cl. 148-435.000.

Rudolphy, Albert: *See*—
Hultzsch, Kurt; and Rudolphy, Albert, 4,401,791, Cl. 525-132.000.

Ruetz, Georg: *See*—
Deutschmann, Herbert; and Ruetz, Georg, 4,400,945, Cl. 60-612.000.

Ruf, Erich, to Th. Goldschmidt AG. Process for coloring aluminum electrolytically with metal salts. 4,401,525, Cl. 204-42.000.

Ruffing, James M.: *See*—
Fellinger, Frank; and Ruffing, James M., 4,402,079, Cl. 370-84.000.

Ruhemann, Martin S. W., to Petrocarbon Developments Limited. Producing power from a cryogenic liquid. 4,400,947, Cl. 60-648.000.

Rumble, Ray M., to Michigan Pipe Fittings Co. Div. of Michigan Hanger Co. Pipe coupling with a locking device. 4,401,324, Cl. 285-90.000.

Russell, Angus R. T., to Singer Company, The. Thread trimming mechanism for sewing machines. 4,401,045, Cl. 112-286.000.

Russell, Robert B.: *See*—
Gilvar, Martin; and Russell, Robert B., 4,401,481, Cl. 148-12.00B.

Russell, T. W. Fraser: *See*—
Baron, Bill N.; Rocheleau, Richard E.; and Russell, T. W. Fraser, 4,401,052, Cl. 118-718.000.

Russo, Joseph; Sonder, Richard; Miller, Robert E.; and Cauthen, Mark E., to Simmons Universal Corporation. Overbed table. 4,401,036, Cl. 108-146.000.

Ruud, Jan T. Arrangement in connection with nozzles of powder sprayers or for disintegration and distribution of solid particles in powder form in a gas stream. 4,401,275, Cl. 239-704.000.

SAB Nife AB: *See*—
Melin, Ake L.; and Svensson, Vide H., 4,401,463, Cl. 75-44.00S.

Sacilor Acieries et Laminoirs de Lorraine: *See*—
Michaux, Jacques M., 4,400,962, Cl. 72-222.000.

Sado, Ichiro; Kishimoto, Juji; and Murata, Hiroshi, to Canon Kabushiki Kaisha. Electronic digital memorandum. 4,402,056, Cl. 364-705.000.

Safe Package AB: *See*—
Anjou, Gunnar, 4,401,210, Cl. 206-1.500.

Sagawa, Nobukazu: *See*—
Minegishi, Sokichi; Takizawa, Tozo; Kawamura, Hideo; and Sagawa, Nobukazu, 4,401,065, Cl. 123-145.00A.

Saino, Tetsushi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Ishii, Shinichi; Saino, Tetsushi; and Someno, Tetsuya, 4,401,594, Cl. 260-112.50R.

St. Charles Manufacturing Co.: *See*—
Majewski, Stanley J., 4,401,189, Cl. 186-68.000.

St. Clair Wilshire, Philip: *See*—
Witts, Alan G.; and St. Clair Wilshire, Philip, 4,401,994, Cl. 346-83.000.

St-Jean, Guy, to Hydro-Quebec. Modular suction-gas-cooled magnetic blast circuit breaker. 4,401,870, Cl. 200-147.00R.

St. John, Patricia: *See*—
Salmond, Andrea; St. John, Patricia; Luebke, Randall A.; and Van Tassel, Jeffrey B., 4,401,209, Cl. 206-5.000.

Saito, Kazuhisa; Ogawa, Hiroyasu; and Shigei, Tetsuro, to Toho Belson Co., Ltd. Surface-treatment of carbon fiber. 4,401,533, Cl. 204-130.000.

Saito, Norio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Saito, Norio; and Sasaoka, Michio, 4,401,528, Cl. 204-78.000.

Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, to Hitachi, Ltd. Alarm device for a vehicle including priority control for plural alarm conditions. 4,401,971, Cl. 340-52.00F.

Saito, Tamio, to Tokyo Shibaura Denki Kabushiki Kaisha. Two-dimensional thermal head. 4,401,881, Cl. 219-216.000.

Sakaguchi, Hiroo: *See*—
Uchikune; Tagami, Mutsukazu; Shimizu, Taketo; Yanagisawa, Kiyoshi; Yokosawa, Katsuto; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,401,960, Cl. 335-285.000.

Sakaguchi, Ryo; and Ikenaka, Yoshiharu, to Rex Industries Co., Ltd. Scroll chuck device. 4,401,308, Cl. 279-114.000.

Sakaguchi, Yuji: *See*—
Tsuchiya, Kazuo; Masuda, Hirotsugu; and Sakaguchi, Yuji, 4,401,325, Cl. 285-231.000.

Sakakibara, Susumu: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Sakakibara, Susumu; Abe, Ryozo; and Sano, Yasushi, 4,402,070, Cl. 369-43.000.

Sakamoto, Fukuma; Isshiki, Isao; Tanaka, Masatoshi; and Satoh, Koji, to Sumitomo Electric Industries, Ltd. Binary coding circuit. 4,402,087, Cl. 382-53.000.

Sakata, Kazuomi: *See*—
Aoyagi, Akira; Sakata, Kazuomi; Ikeda, Shinichi; and Koyama, Mashiro, 4,400,981, Cl. 73-862.510.

Sakurai, Isao: *See*—
Minejima, Teruo; and Sakurai, Isao, 4,401,382, Cl. 355-3.0SH.

Salamone, Ann B., to Thiokol Corporation. Skin conditioning polymers containing alkoxylated nitrogen salts of sulfonic acid. 4,401,650, Cl. 424-78.000.

Saleck, Wilhelm: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,401,751, Cl. 430-375.000.

Salina, Louis E.; and Lescovich, Joseph E., to GA Industries Inc. Heavy duty electric pump control unit. 4,401,412, Cl. 417-12.000.

Salisbury, Winfield W., to Occidental Research Corporation. Particle-induced thermonuclear fusion. 4,401,618, Cl. 376-106.000.

Salle, Jacques E.: *See*—
Athenes, Claude; and Salle, Jacques E., 4,402,078, Cl. 370-66.000.

Salmond, Andrea; St. John, Patricia; Luebke, Randall A.; and Van Tassel, Jeffrey B., to Rods and Cones, Inc. Spectacle case. 4,401,209, Cl. 206-5.000.

Salzle, Erich: *See*—
Gunther, Paul, 4,401,051, Cl. 118-326.000.

Sam J. Brown Land and Cattle Company, Inc.: *See*—
Brown, Sam J., 4,401,166, Cl. 172-430.000.

Samanta, Shyam K.: *See*—
Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, 4,401,617, Cl. 264-332.000.

Sampei, Tohru: *See*—
Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, 4,401,971, Cl. 340-52.00F.

Sanders, Ian L.: *See*—
Best, John S.; and Sanders, Ian L., 4,402,060, Cl. 365-36.000.

Sanders, Thomas J.; and White, William H., to Harris Corporation. Radiation hardened-self aligned CMOS and method of fabrication. 4,402,002, Cl. 357-42.000.

Sanderson, Robert A., to Graham Magnetics, Inc. Tape cleaning apparatus. 4,400,846, Cl. 15-306.00A.

Sanner, Medford D.: *See*—
McWaters, Lynn D.; and Sanner, Medford D., 4,402,088, Cl. 382-68.000.

Sano, Hiroshi, to Tomy Kogyo Company, Inc. Simulated racing game. 4,401,305, Cl. 273-86.00F.

Sano, Yasushi: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Sakakibara, Susumu; Abe, Ryozo; and Sano, Yasushi, 4,402,070, Cl. 369-43.000.

Sano, Yukinori; Hoshi, Yoshikazu; and Takahashi, Ikuo, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Fuel injection control system for electromagnetic valve-controlled fuel injection pump of diesel engine. 4,401,076, Cl. 123-357.000.

Sansui Electric Co., Ltd.: *See*—
Tanaka, Susumu, 4,401,951, Cl. 330-268.000.

Sanyo Electric Co., Ltd.: *See*—
Morikawa, Eiji, 4,401,857, Cl. 179-110.00A.

Sartorius GmbH: *See*—
Knothe, Erich; Melcher, Franz-Josef; Ober, Jurgen; Sodler, Walter; and Martens, Veronika, 4,401,176, Cl. 177-180.000.

Sasaki, Kan: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,400,989, Cl. 74-467.000.

Sasaki, Yasuo: *See*—
Sekizawa, Masaaki; and Sasaki, Yasuo, 4,401,167, Cl. 173-162.00H.

Sasaki, Yoshio: *See*—
Kinoshita, Minoru; and Sasaki, Yoshio, 4,400,949, Cl. 62-140.000.

Sasaoka, Michio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Saito, Norio; and Sasaoka, Michio, 4,401,528, Cl. 204-78.000.

Satake, Sachio: *See*—
Ishikawa, Hiroshi; and Satake, Sachio, 4,401,310, Cl. 280-6.100.

Sato, Akihiko; and Magariyama, Kenichi, to Nippon Kogaku K. K. Motor-driven film transporting device in a single lens reflex camera including means for selectively driving film in a wind-up mode and a rewind mode. 4,401,377, Cl. 354-173.000.

Sato, Akihiko; Nakano, Yoshiyuki; and Tanaka, Etsuo, to Nippon Kogaku K.K. Blade for focal plane shutter. 4,401,380, Cl. 354-246.000.

Sato, Eiichi: *See*—
Suzuki, Yoshiro; Yasuda, Tadahiro; Nishikawa, Masaji; Sato, Eiichi; and Aoki, Tadashi, 4,401,383, Cl. 355-3.0TR.

Sato, Hiroshi, to Daiichi Electric Co., Ltd. Chart recorder recording method and apparatus. 4,401,995, Cl. 346-110.00R.

Sato, Takayuki; and Tanaka, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Device adapted for supporting conductors, and the combination of the conductors and the supporting device. 4,401,846, Cl. 174-149.00B.

Sato, Yoichi: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, 4,401,180, Cl. 180-148.000.

Satoh, Atsushi: *See*—
Koike, Mitsuhito; and Satoh, Atsushi, 4,400,952, Cl. 66-60.00H.

Satoh, Koji: *See*—
Sakamoto, Fukuma; Isshiki, Isao; Tanaka, Masatoshi; and Satoh, Koji, 4,402,087, Cl. 382-53.000.

Satomi, Takeo; Sumida, Seizo; and Yoshida, Ryo, to Sumitomo Chemical Company, Limited. Herbicidal composition having enhanced herbicidal activity with high selectivity to soybean. 4,401,459, Cl. 71-94.000.

Sattler, Frank A.: *See*—
Su, Wei-Fang A.; and Sattler, Frank A., 4,401,962, Cl. 336-205.000.

Sawai, Tadashi: *See*—
Shirai, Iwao; Momose, Keigo; Sawai, Tadashi; Komatsu, Masakazu; Inoue, Takao; and Wakahata, Tamotsu, 4,401,733, Cl. 429-174.000.

Saytech, Inc.: *See*—
Barda, Henry J.; and Lesniewski, Joseph M., 4,401,778, Cl. 524-89.000.

Scandinavian Lancers Aktiebolaget: *See*—
Tivelius, Bertil G., 4,401,464, Cl. 75-49.000.

Schaefer Marine, Inc.: *See*—
Merry, Carl A., 4,401,333, Cl. 294-83.00R.

Schaffer, J. Thomas: *See*—
Moser, Richard A.; Schaffer, J. Thomas; and Weinstein, Richard, 4,402,030, Cl. 361-93.000.

Schaming, Edward J. Apparatus for removing liquid coolant from metal strips in a rolling mill. 4,400,961, Cl. 72-201.000.

Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, to American Cyanamid Company. N,N'-Bis(glucopyranosyl-D-glucopyranosyloxyphenyl)alkaline and methods of use. 4,401,661, Cl. 424-180.000.

Schauffele, Frithjof: *See*—
Diederich, Gerd; Solmecke, Rolf; Husselmann, Hans; Heimann, Eberhard; and Schauffele, Frithjof, 4,401,243, Cl. 222-591.000.

Schedler, Johannes: *See*—
Kanzler, Walter; and Schedler, Johannes, 4,401,514, Cl. 203-15.000.

Schellinger, Richard, Jr., to FMC Corporation. Composition and process for printed circuit etching using a sulfuric acid solution containing hydrogen peroxide. 4,401,509, Cl. 156-666.000.

Scheuchzer, Fredy; and Buhler, Fritz, to Les Fils d'Auguste Scheuchzer S.A. Method and railway train for draining a railway track. 4,400,897, Cl. 37-104.000.

Scheuffgen, Ingeborg, to Henkel Kommanditgesellschaft auf Aktien. Cream base composition. 4,401,664, Cl. 424-365.000.

Schey, John A., to Modine Manufacturing Company. Forming integral flanges in a sheet apparatus therefore. 4,400,965, Cl. 72-334.000.

Schickfluss, Rudolf; Schneider, Manfred; and Schuster, Claus, to Hoechst Aktiengesellschaft. Transfer-printing support. 4,401,692, Cl. 8-471.000.

Schimel, Keith A. Systems for the treatment of organic material and particularly sewage sludge. 4,401,565, Cl. 210-258.000.

Schinkmann, Manfred; and Busack, Hans-Jurgen, to Dragerwerk Aktiengesellschaft. Polarographic apparatus with detachable sample chamber for measuring blood gases. 4,401,547, Cl. 204-415.000.

Schlag, Johannes: *See—*
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; Schlag, Johannes; Kiener, Volker; and Boehm, Hugo, 4,401,545, Cl. 204-291.000.

Schler, Eli. High rise life escape ladders. 4,401,183, Cl. 182-8.000.

Schlienger, Max P.; and Szeto, Whalun, to Retech, Inc. Saw blade for high speed electric arc saw. 4,401,875, Cl. 219-69.00V.

Schmidt, Hans T., to Audi NSU Auto Union Aktiengesellschaft. Upholstered seat for motor vehicle. 4,401,343, Cl. 297-284.000.

Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of thermoplastic aromatic polyphosphonatocarbonates with improved heat-ageing resistance, and their use. 4,401,802, Cl. 528-167.000.

Schmidt, Oskar. Method and apparatus for molding a tire with an annular reinforcement below the tread surface. 4,401,502, Cl. 156-397.000.

Schnegg, Ulrich; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of 4-chloro-2,6-dialkylanilines. 4,401,833, Cl. 564-412.000.

Schneider, Abraham I.: *See—*
Burdette, George W.; and Schneider, Abraham I., 4,401,837, Cl. 585-253.000.

Schneider, Alan A.; Flower, Ronald J.; Bowser, George C.; and Kenyon, Lewis C., to Catalyst Research Corporation. Telephone communication system. 4,401,847, Cl. 179-1.00H.

Schneider, Manfred: *See—*
Schickfluss, Rudolf; Schneider, Manfred; and Schuster, Claus, 4,401,692, Cl. 8-471.000.

Schneider, Ralf: *See—*
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Scholer, Horst D.: *See—*
Paskarbeit, Edgar; and Scholer, Horst D., 4,402,083, Cl. 373-79.000.

Schone, Gerhard: *See—*
Rathjens, Dieter; and Schone, Gerhard, 4,402,009, Cl. 358-125 000.

Schonteich, Peter: *See—*
Epper, Wolfgang; Michalski, Lothar; and Schonteich, Peter, 4,401,564, Cl. 210-150.000.

Schou, Carl E. Positive clutch differential. 4,400,996, Cl. 74-650.000.

Schramm, Walter, to Linde Aktiengesellschaft. Economic recovery of ethylene and/or propylene from low concentration feeds. 4,401,450, Cl. 62-13.000.

Schreurs, Gerardus C. M.: *See—*
Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,401,774, Cl. 523-402.000.

Schroeder, Clifford A., to C.A. Schroeder, Inc. Method of making a rigid fiberglass duct having an integral bendable elbow. 4,400,863, Cl. 29-450.000.

Schroer, Walter: *See—*
Pedain, Josef; Thoma, Wilhelm; Grammel, Jurgen; and Schroer, Walter, 4,401,801, Cl. 528-67.000.

Schubert, Frank R.: *See—*
O'Keefe, Patrick J., Jr.; Schubert, Frank R.; and Rini, Guy T., 4,401,075, Cl. 123-352.000.

Schultz, Gary V.: *See—*
Beck, David A.; and Schultz, Gary V., 4,401,147, Cl. 162-263.000.

Schuster, Claus: *See—*
Schickfluss, Rudolf; Schneider, Manfred; and Schuster, Claus, 4,401,692, Cl. 8-471.000.

Schwaikert, Ralph A., to Rasco Incorporated. Child-resistant closure unit. 4,401,225, Cl. 215-211.000.

Schwartz, Boris. Storage, mixing and filtering receptacle for syringe. 4,401,432, Cl. 604-89.000.

Schwarz, Alfred V. Road vehicle control system. 4,401,181, Cl. 180-168.000.

Schwarz, Thomas: *See—*
Garnett, John L.; Schwarz, Thomas; and Fletcher, Grant, 4,401,688, Cl. 427-43.100.

Schwarzmann, Matthias: *See—*
Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, 4,401,637, Cl. 423-329.000.

Schwertfeger, Werner, to Hoechst Aktiengesellschaft. Process for the preparation of perfluorinated carboxylic acid fluorides. 4,401,829, Cl. 560-180.000.

Schwuttke, Guenter H.: *See—*
Liu, James K.; Schwuttke, Guenter H.; and Koliwad, Krishna M., 4,401,505, Cl. 156-608.000.

SCM Corporation: *See—*
Moskowitz, Larry N.; and Klar, Erhard, 4,401,724, Cl. 428-564.000.

Scotia Recovery Systems Limited: *See—*
Poetschke, Leonard E.; and Zeitz, Vernon, 4,401,437, Cl. 44-2.000.

Scovill, John P.: *See—*
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,401,670, Cl. 424-250.000.

Seaco Industries: *See—*
Brux, Robert A., 4,401,020, Cl. 100-7.000.

Sealed Air Corporation: *See—*
Malwitz, Nelson, 4,401,769, Cl. 521-113.000.

Seelen-Kruijssen, Josepha M. E.: *See—*
Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,401,774, Cl. 523-402.000.

Seffren, Sidney S.: *See—*
Pampalone, Thomas R.; and Seffren, Sidney S., 4,401,775, Cl. 523-403.000.

Segawa, Yoshihiro: *See—*
Miwa, Naoto; and Segawa, Yoshihiro, 4,401,967, Cl. 338-34.000.

Segrest, William W. Progressive moveable hearth cremator. 4,401,038, Cl. 110-194.000.

Seidenberger, James W., to J. T. Baker Chemical Company. Method and apparatus for trapping flying insects exhibiting phototropic behavior, particularly gypsy moths. 4,400,903, Cl. 43-122.000.

Seifried, Walter: *See—*
Andra, Klaus; Hutschenreuter, Elfriede; and Seifried, Walter, 4,401,135, Cl. 138-118.100.

Seitel, Norbert F.: *See—*
McDonald, Walter; and Seitel, Norbert F., 4,401,203, Cl. 198-392.000.

Seitzer, Walter H.: *See—*
Elanchenny, Vythilingam; and Seitzer, Walter H., 4,401,552, Cl. 208-11.0LE.

Seki, Nakaharu: *See—*
Ozawa, Kazunori; Kawana, Takahiro; Seki, Nakaharu; and Komada, Naoya, 4,401,725, Cl. 428-457.000.

Sekiguchi, Takeshi. Music box spring winding mechanism. 4,401,006, Cl. 84-95.00R.

Sekikawa, Nobuyoshi: *See—*
Ikeda, Teppei; Ishige, Sadao; Sekikawa, Nobuyoshi; Igarashi, Akira; and Sugiyama, Takekatsu, 4,401,717, Cl. 428-425.100.

Sekizawa, Masaaki; and Sasaki, Yasuo, to Hitachi Koki Company, Limited. Vibratory tool with a vibration proof mechanism for the handle thereof. 4,401,167, Cl. 173-162.00H.

Sela, Michael: *See—*
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; Sela, Michael; and Lederer, Edgar, 4,401,659, Cl. 424-177.000.

Selin, Terry G., to General Electric Company. Method for production of mercapto functional silanes. 4,401,826, Cl. 556-429.000.

Sellers, Jerry W.: *See—*
Fisher, Robert J.; Jaworowicz, Arthur C.; Lyle, John M.; Sellers, Jerry W.; and Steed, Gary R., 4,401,289, Cl. 248-483.000.

Selvi, Fabio; and Chietti, Giovanni, to C.K.S. S.n.c. Automatic apparatus for superimposing, folding and transferring pairs of stockings to a collection station. 4,401,244, Cl. 223-37.000.

Semen, John: *See—*
Axelrod, Robert J.; Liberti, Frank N.; and Semen, John, 4,401,792, Cl. 525-175.000.

Seng, Stephen: *See—*
Propster, Mark A.; Seng, Stephen; and Hohman, Charles M., 4,401,453, Cl. 65-27.000.

Senga, Takao; Koishi, Masafumi; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Method for treating lithographic printing plates (II). 4,401,739, Cl. 430-16.000.

Senour, Stephen D. Flash adapter for folding camera. 4,401,375, Cl. 354-141.000.

Service Master Industries, Inc.: *See—*
Blomgren, Roland A., 4,400,843, Cl. 15-49.00R.

Setbon, Raoul, to Thomson-CSF. Safety device for extra-high voltage generator, particularly an X-ray generator. 4,402,086, Cl. 378-112.000.

Seto, Kin; and Warren, Ian H., to C-I-L Inc. Composite electrodes for diaphragmless electrolytic cells for the production of chlorates and hypochlorites II. 4,401,544, Cl. 204-288.000.

Seyler, Jay K.: *See—*
Orlowski, Ronald C.; and Seyler, Jay K., 4,401,593, Cl. 260-112.50T.

Seymour, Robert W.: *See—*
Weemes, Doyle A.; Seymour, Robert W.; and Wicker, Thomas H., 4,401,805, Cl. 528-302.000.

Sezaki, Eiji: *See—*
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,401,799, Cl. 526-142.000.

Sharp: *See—*
Miyazaki, Takaaki; Hashimoto, Sadakatsu; and Nishiyama, Mitsuru, 4,401,370, Cl. 350-357.000.

Sharp Kabushiki Kaisha: *See—*
Aiba, Masahiko; Yamamoto, Yoichi; Iwai, Hiroji; and Umeda, Ikuo, 4,401,990, Cl. 346-75.000.

Sheinaus, Harold; and Marcus, Arnold D., to Bristol-Myers Company. Sleep-aid composition containing an analgesic and diphenhydramine dihydrogencitrate, and method of use. 4,401,665, Cl. 424-233.000.

Shell Oil Company: *See—*
Blytas, George C.; and June, Ronald K., 4,401,570, Cl. 210-639.000.
Blytas, George C.; and Diaz, Zaida, 4,401,642, Cl. 423-573.00G.
Graiff, L. B.; and Kiovsky, T. E., 4,401,439, Cl. 44-63.000.
Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,401,774, Cl. 523-402.000.
Stewart, Thomas L.; and Demny, Florian C., 4,401,575, Cl. 210-746.000.

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Korbell, George K., 4,401,939, Cl. 322-59.000.

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Saito, Kazuhisa; Ogawa, Hiroyasu; and Shigei, Tetsuro, 4,401,533, Cl. 204-130.000.
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Itoh, Hideo; and Shimada, Hiroshi, 4,402,066, Cl. 365-189.000.
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Ikeda, Satoshi, 4,401,206, Cl. 198-549.000.
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Madsen, Brent W.; Dolezal, Henry; Bloom, Philip A.; and Shirts, Monte B., 4,401,632, Cl. 423-87.000.
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Arai, Kozo; Suzuki, Takao; and Umetsu, Syozo, 4,401,489, Cl. 148-438.000.
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Shellenberger, Richard H., 4,401,968, Cl. 338-176.000.
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Eaton, Gerald E.; and Shtarkman, Emile M., 4,401,298, Cl. 267-140.100.
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Newton, Ronald O.; Shute, Bruce W.; and Allen, John J., Jr., 4,402,047, Cl. 364-426.000.
Sibaoka, Hazime: *See*—
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Sidvers, John: *See*—
Hume, James G.; Sidvers, John; and Foster, Harold S., 4,401,394, Cl. 400-208.000.
Siefried, Walter: *See*—
Porrmann, Herbert; Siefried, Walter; Klenk, Ludwig; and Stenger, Karl, 4,401,136, Cl. 138-118.100.
Siemens Aktiengesellschaft: *See*—
Distler, Walter; and Heinzelmann, Karl-Georg, 4,402,085, Cl. 378-15.000.
Engelhardt, Werner, 4,400,958, Cl. 72-16.000.
Jungmeister, Hans G., 4,402,084, Cl. 375-4.000.
Mueller, Horst, 4,402,080, Cl. 370-100.000.
Renz, Klaus, 4,401,942, Cl. 324-60.00C.
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McKeighen, Ronald E.; and Buchin, Michael P., 4,401,957, Cl. 333-165.000.
Sigma-Tau: *See*—
de Witt, Paolo, 4,401,827, Cl. 560-1.000.
Signode Corporation: *See*—
Nikolich, Milovan, 4,401,251, Cl. 227-130.000.
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Droira, Diego I.; and Sikorski, Richard J., 4,401,234, Cl. 221-92.000.
Silva, Raimund H.; and Smith, Roger A., to Du Pont de Nemours, E. I., and Company. Cation exchange membrane with high equivalent weight component. 4,401,711, Cl. 428-252.000.
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Koike, Mitsuhito; and Satoh, Atsushi, 4,400,952, Cl. 66-60.00H.
Silverman, Richard: *See*—
Baldwin, Wilbur A.; Silverman, Richard; Jezorek, Leigh; and Pitel, Irving, 4,401,003, Cl. 83-483.000.
Simmonds, John H. J., to British Aerospace Public Limited Company. Aircraft undercarriage unit. 4,401,285, Cl. 244-100.00R.
Simmonds, Richard S.; and Owen, Wells P., to Allied Corporation. Process for the preparation of stroma-free hemoglobin solutions. 4,401,652, Cl. 424-101.000.
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Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., to GTE Automatic Electric Labs Inc. Dual rail time and control unit for a duplex T-S-T-digital switching system. 4,402,077, Cl. 370-63.000.
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Russo, Joseph; Sonder, Richard; Miller, Robert E.; and Cauthen, Mark E., 4,401,036, Cl. 108-146.000.
Simmons USA Corporation: *See*—
Stumpf, Walter, 4,401,501, Cl. 156-367.000.
Simonds, Gary; and McKee, Arnold D., to Victor United, Inc. Compound bow with over-lapping track cams. 4,401,097, Cl. 124-23.00R.
Simons, Elliot; and Boulos, Robert. Swimming apparatus. 4,401,118, Cl. 128-207.140.
Simpson, Orvin D.: *See*—
Cunningham, William E.; and Simpson, Orvin D., 4,401,941, Cl. 324-54.000.
Singer Company, The: *See*—
Peterson, Wesley R., 4,401,043, Cl. 112-199.000.
Russell, Angus R. T., 4,401,045, Cl. 112-286.000.
Sirvins, Andre: *See*—
Tellier, Jacques; Sirvins, Andre; Gautier, Jean-Claude; and Tramier, Bernard, 4,401,762, Cl. 435-243.000.
Skjaeveland, Magne, to Kverneland A/S. Hinge assembly. 4,400,994, Cl. 74-520.000.
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Ferguson, Harry D.; and Slack, Michael K., 4,401,975, Cl. 340-384.00E.
Slater, Harold E.; and Alspaugh, Thomas R. Water heating system. 4,401,100, Cl. 126-362.000.
Slaughter, Raymond J., to BICC Limited. Optical guides. 4,401,361, Cl. 350-96.230.
Sly, Rex. Boot shaper. 4,400,840, Cl. 12-114.400.
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Otto, Neil C.; Warner, Barry T.; Smaga, John A.; and Battles, James E., 4,401,714, Cl. 429-221.000.
Smedley, William H.: *See*—
Haber, Terry M.; and Smedley, William H., 4,401,107, Cl. 128-1.00R.
Smith, Anthony R., to Bethlehem Steel Corporation. Apparatus for monitoring feed of granular material. 4,401,237, Cl. 222-56.000.
Smith, David S., to Technicon Instruments Corporation. Immunoassays employing labeled reagent and a conjugate having two binding sites. 4,401,764, Cl. 436-500.000.
Smith International, Inc.: *See*—
Dailey, Patrick E., 4,401,134, Cl. 137-624.110.
Smith, Peter C., to General Electric Company. Method for enlarging grain size of uranium oxide. 4,401,608, Cl. 264-0.500.
Smith, Roger A.: *See*—
Silva, Raimund H.; and Smith, Roger A., 4,401,711, Cl. 428-252.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Ammerling, Willi J.; and Muller, Alfred, 4,401,294, Cl. 266-112.000.
Smyth, Harold T., to Johnson and Johnson. Highly reactive ion-leachable glass. 4,401,773, Cl. 523-116.000.
Snow Brand Milk Products Co., Ltd.: *See*—
Kashiwabara, Norio; Maruyama, Hirotaka; Ishii, Tetuo; and Kondo, Satoru, 4,401,657, Cl. 424-177.000.
Snyder, Harold: *See*—
Jhaveri, Vidyut; Mazzacca, Alfred J.; and Snyder, Harold, 4,401,569, Cl. 210-610.000.
Socha, Johannes, to W. Schlafhorst & Co. Method and device for depositing sliver in a rotating can. 4,400,854, Cl. 19-159.00R.
Societe Anonyme d'Attelages Lemoine: *See*—
Ealet, Pierre M., 4,401,405, Cl. 414-428.000.
Societe Anonyme de Tele Communication: *See*—
Bargeton, Gilbert L.; and Beynie, Claude P., 4,402,075, Cl. 370-15.000.
Societe CEM-Compagnie Electromecanique & CIE SNC.: *See*—
Thuy, M. N'Guyen U., 4,401,927, Cl. 318-379.000.

Societe de Machines pour la Transformation des Plastiques: *See*—
Bellehache, Pierre; and Houdan, Jean M., 4,401,423, Cl. 425-210.000.

Societe de'Etudes Scientifiques et Industrielles de l'Ile-de France: *See*—
Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, 4,401,822, Cl. 548-567.000.

Societe Francaise Des Produits Pour Catalyse: *See*—
Juguin, Bernard; Martino, Germain; and Miquel, Jean, 4,401,557, Cl. 208-139.000.

Societe L. Ferraz: *See*—
Cabaussel, Louis, 4,401,908, Cl. 310-229.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Tellier, Jacques; , Sirvins, Andre; Gautier, Jean-Claude; and Tramier, Bernard, 4,401,762, Cl. 435-243.000.

Societe Vetrotex Saint-Gobain: *See*—
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and [illegible]din, Jean-Pierre, 4,401,451, Cl. 65-1.000.

Sodler, Walter: *See*—
Knothe, Erich; Melcher, Franz-Josef; Ober, Jurgen; Sodler, Walter; and Martens, Veronika, 4,401,176, Cl. 177-180.000.

Soejima, Masami: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; Soejima, Masami; and Masaki, Takeharu, 4,401,757, Cl. 435-71.000.

Solmecke, Rolf: *See*—
Diederich, Gerd; Solmecke, Rolf; Husselmann, Hans; Heimann, Eberhard; and Schauffele, Frithjof, 4,401,243, Cl. 222-591.000.

Solomon, Elias E., to Gamewell Corporation, The. Combination detector. 4,401,978, Cl. 340-628.000.

Somartec S.A., Firma: *See*—
Rodler, Hans, 4,401,121, Cl. 128-420.00A.

Someno, Tetsuya: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Ishii, Shinichi; Saino, Tetsushi; and Someno, Tetsuya, 4,401,594, Cl. 260-112.50R.

Sommer, Albrecht; and Sparenberg, Heinrich, to Gewerkschaft Walter. Method and device for installing a shaft lining in shafts through an aquiferous formation. 4,401,397, Cl. 405-133.000.

Sommerer, Raymond, to Motorola Inc. Temperature compensated circuit. 4,401,898, Cl. 307-310.000.

Sonatech, Inc.: *See*—
Cyr, Reginald J., 4,401,987, Cl. 343-5.0CF.

Sonder, Richard: *See*—
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Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, to Sony Corporation. Method and apparatus for recording digitized information on a record medium. 4,402,021, Cl. 360-72.200.

Sony Corporation: *See*—
Narimatsu, Akihisa; and Ohkubo, Hiroyuki, 4,401,944, Cl. 324-207.000.
Ohkubo, Hiroyuki; Maru, Hiroshi; Kato, Yoshito; and Hashimoto, Toshio, 4,400,890, Cl. 33-125.00C.
Okada, Takashi, 4,401,899, Cl. 307-350.000.
Ozawa, Kazunori; Kawana, Takaniro; Seki, Nakaharu; and Komada, Naoya, 4,401,725, Cl. 428-457.000.
Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, 4,402,021, Cl. 360-72.200.
Suzuki, Tadao, 4,401,954, Cl. 330-297.000.

Sopko, John F., to PPG Industries, Inc. Method of and apparatus for applying powder coating reactants. 4,401,695, Cl. 427-180.000.

Southgate, Robert: *See*—
Baxter, Andrew J. G.; Roberts, Patricia M.; and Southgate, Robert, 4,401,595, Cl. 260-239.00A.

Sovilla, Heinz. Multi-ply heat-insulating material. 4,401,706, Cl. 428-158.000.

Spainhour, Carroll D., to Western Electric Company, Inc. Torch. 4,401,267, Cl. 239-132.300.

Spamer, William S., to Mead Corporation, The. Pitch adapter unit for display devices. 4,401,223, Cl. 211-134.000.

Sparenberg, Heinrich: *See*—
Sommer, Albrecht; and Sparenberg, Heinrich, 4,401,397, Cl. 405-133.000.

Specktor, Gerald A., to Align-Tech, Inc. Apparatus for securing a vehicle to be straightened. 4,400,969, Cl. 72-457.000.

Spector, George: *See*—
Ali, Khayyam; and Spector, George, 4,401,438, Cl. 44-45.000.

Spencer, Jack D.; and Donovan, Joseph F., to Baker International Corporation. One trip multi-zone gravel packing apparatus. 4,401,158, Cl. 166-51.000.

Sperry Corporation: *See*—
Hermansdorfer, James E.; and Spurgin, William T., 4,401,932, Cl. 318-696.000.

Spigarelli, Rudolph D.; Aker, John L.; and Berry, Fred M., to Kansas City Southern Railway Company. Control device for multiple unit locomotive systems. 4,401,035, Cl. 105-61.000.

Spindle, Harvey E.: *See*—
Meyer, Jeffry R.; Billings, John S., Jr.; Spindle, Harvey E.; and Hofmann, Charles F., 4,401,841, Cl. 174-31.00R.

Spindola, Kenneth: *See*—
Bailey, Milton; Spindola, Kenneth; and Bernstein, Sumner H., 4,401,707, Cl. 428-166.000.

Spintex, Inc.: *See*—
Campbell, James S., 4,401,349, Cl. 308-189.00R.

Sprague Electric Company: *See*—
Webber, Dean A.; and Bosse, Peter S., 4,401,877, Cl. 219-121.0LJ.

Sprengers, Leo M.: *See*—
Frank, Gunter; Kostlin, Heiner; Sprengers, Leo M.; and Campbell, Ronald J., 4,401,693, Cl. 427-160.000.

Spugios, Aristos G., to W-L Molding Company. Conveyor-separator with adjustable separation gap. 4,401,562, Cl. 209-615.000.

Spurgin, William T.: *See*—
Hermansdorfer, James E.; and Spurgin, William T., 4,401,932, Cl. 318-696.000.

Srivastava, Ajit K.: *See*—
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., 4,400,983, Cl. 74-25.000.

Stabenow, Joachim: *See*—
Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, 4,401,637, Cl. 423-329.000.

Stacy, Carl J.: *See*—
MacDonell, Gary D.; and Stacy, Carl J., 4,401,535, Cl. 204-158.00R.

Stadalnik, Robert C.: *See*—
Krohn, Kenneth A.; Vera, David R.; and Stadalnik, Robert C., 4,401,647, Cl. 424-1.500.

Stadelmayr, Hans-Gunther. Multiple sensor interconnected alarm system responsive to different variables. 4,401,976, Cl. 340-522.000.

Staerzl, Richard E., to Brunswick Corporation. Shut down protection apparatus for a water cooled internal combustion engine. 4,401,085, Cl. 123-488.000.

Stair Aid Corporation of North America: *See*—
Studer, Beat W., 4,401,178, Cl. 180-8.00A.

Standard Oil Company, The: *See*—
Elkins, Lincoln F., 4,401,163, Cl. 166-259.000.

Standard Oil Company (Indiana): *See*—
Paul, Thomas R., 4,401,708, Cl. 428-198.000.
Pellet, Regis J.; Bertolacini, Ralph J.; and Lysholm, Donna L., 4,401,558, Cl. 208-139.000.

Standex International Corporation: *See*—
Ekholm, Carl R., 4,401,110, Cl. 128-70.000.

Stark, Gerhard. Machine tool. 4,401,400, Cl. 408-71.000.

Starkstrom Gummersbach GmbH: *See*—
Grunst, Heinz, 4,401,867, Cl. 200-76.000.
Lemmer, Helmut; and Breidenbach, Kurt, 4,401,863, Cl. 200-16.00A.

Statewide Pools, Inc.: *See*—
Corna, John F.; and Blais, Marcel H., 4,400,834, Cl. 4-506.000.

Stauffer, Randy C.: *See*—
Davis, Ralph A.; and Stauffer, Randy C., 4,401,435, Cl. 8-627.000.

Ste Look: *See*—
Beyl, Jean J. A., 4,401,318, Cl. 280-630.000.

Steed, Gary R.: *See*—
Fisher, Robert J.; Jaworowicz, Arthur C.; Lyle, John M.; Sellers, Jerry W.; and Steed, Gary R., 4,401,289, Cl. 248-483.000.

Steegmuller, Willi: *See*—
Fischer, Helmut; and Steegmuller, Willi, 4,401,518, Cl. 204-1.00T.

Steel, Cynthia L., to Minnesota Mining and Manufacturing Company. Textile treatments. 4,401,780, Cl. 524-225.000.

Steele, Raymond, to Bell Telephone Laboratories, Incorporated. Simultaneous transmission of an analog message signal and a digital data signal. 4,401,854, Cl. 179-1.50R.

Steenbergen, Suzanna M.: *See*—
Peik, Jerry A.; Steenbergen, Suzanna M.; and Hayden, Harold R., 4,401,760, Cl. 435-101.000.

Steers, Michel; and Hazan, Jean-Pierre, to U.S. Philips Corporation. Method of determining the average nature of the materials of the laundry in a laundry washing machine and washing machine employing said method. 4,400,838, Cl. 8-158.000.

Steimer, Werner: *See*—
Zurner, Hans-Jurgen; Emmerling, Wolfram; and Steimer, Werner, 4,401,071, Cl. 123-276.000.

Steinleitner, Gunther, to Brown, Boveri and Cie AG. Electrochemical storage cell. 4,401,731, Cl. 429-104.000.

Stelte, David J.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,402,077, Cl. 370-63.000.

Stenger, Karl: *See*—
Porrmann, Herbert; Siefried, Walter; Klenk, Ludwig; and Stenger, Karl, 4,401,136, Cl. 138-118.100.

Stephenson, Ellis D., heir: *See*—
Stephenson, Peter S., Sr.; and Stephenson, Ellis D., heir, 4,401,098, Cl. 126-61.000.

Stephenson, Peter S., Sr.; and Stephenson, Ellis D., heir. Wood by-pass furnace. 4,401,098, Cl. 126-61.000.

Steppan, Hartmut; Wildenhain, Barbara; and Ruckert, Hans, to Hoechst Aktiengesellschaft. Process for the preparation of screen printing stencils by an electroplating method. 4,401,520, Cl. 204-11.000.

Steuer, Werner, to Fichtel & Sachs AG. Drive hub for bicycles or the like. 4,400,999, Cl. 74-781.00B.

Stevens, Frederick F.: *See*—
Hillberg, Robert L.; and Stevens, Frederick F., 4,400,900, Cl. 42-69.00R.

Stevens, Keith D.: *See*—
Morton, John; and Stevens, Keith D., 4,401,926, Cl. 318-376.000.

Stewart, Thomas L.; and Demny, Florian C., to Shell Oil Company. BS And W in crude oil streams. 4,401,575, Cl. 210-746.000.

Stewart-Warner Corporation: *See*—
Tramontini, Vernon N., 4,401,254, Cl. 228-217.000.

Stiftelsen Institutet For Mikrovagsteknik: *See*—
Berggren, Benny; and Boling, Goran, 4,401,873, Cl. 219-10.55A.

Stone, Lyndon R.; and Hall, James D., to Baker International Corporation. Apparatus for making threaded joints incorporating a make-up speed controller. 4,402,052, Cl. 364-506.000.
Storage Technology Corporation: *See*—
Anderson, Kurt M.; and Morehouse, James, 4,402,025, Cl. 360-98.000.
Storer, Richard E.: *See*—
Hartshorn, Frank; le Vesconte, Ivor J. R.; Murphy, Brian J. M.; and Storer, Richard E., 4,400,839, Cl. 12-12.500.
Stovin, Garfield W.: *See*—
Szabo, Robert J.; and Stovin, Garfield W., 4,400,919, Cl. 52-169.120.
Strahan, Virgil H.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,401,694, Cl. 427-162.000.
Strangman, Thomas E., to United Technologies Corporation. Method for producing columnar grain ceramic thermal barrier coatings. 4,401,697, Cl. 427-250.000.
Streckmann, George L.; and Yancy, Jerry W., to Texas Instruments Incorporated. Optical slip ring. 4,401,360, Cl. 350-96.150.
Street, William L.; and Summers, James W. Animal protective apparatus and method for protecting the animal from electrical power. 4,401,055, Cl. 119-14.030.
Strom, Yngve. Instrument for levelling. 4,400,888, Cl. 33-295.000.
Strutt, Derek W.: *See*—
Cook, Ronald A.; and Strutt, Derek W., 4,400,990, Cl. 74-492.000.
Stuart, Bruce W. Strapping buckle construction. 4,400,855, Cl. 24-200.000.
Studer, Beat W., to Stair Aid Corporation of North America. Wheelchair carrier. 4,401,178, Cl. 180-8.00A.
Stuhr, Hans-Waldemar: *See*—
Moranduzzo, Giampaolo; Abels, Theodor; and Stuhr, Hans-Waldemar, 4,400,939, Cl. 60-431.000.
Stumpf, Walter, to Simmons USA Corporation. Apparatus for making assemblies of pocketed springs. 4,401,501, Cl. 156-367.000.
Su, Wei-Fang A.; and Sattler, Frank A., to Westinghouse Electric Corp. Flexible thermally stable tapes containing a high flash point solventless insulating varnish. 4,401,962, Cl. 336-205.000.
Subramanian, Krishnamoorthy: *See*—
Ezis, Andre; Samanta, Shyam K.; and Subramanian, Krishnamoorthy, 4,401,617, Cl. 264-332.000.
Suda, Masashi: *See*—
Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.
Sudo, Tsuneta: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimizu, Masao, 4,402,081, Cl. 371-21.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr: *See*—
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,400,860, Cl. 29-157.00R.
Suehiro, Junichi: *See*—
Miyazaki, Togo; and Suehiro, Junichi, 4,401,982, Cl. 340-758.000.
Sugimura, Masao: *See*—
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, 4,402,050, Cl. 364-460.000.
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Ikeda, Teppei; Ishige, Sadao; Sekikawa, Nobuyoshi; Igarashi, Akira; and Sugiyama, Takekatsu, 4,401,717, Cl. 428-425.100.
Sugizaki, Atsushi: *See*—
Hiyoshi, Kazuhiko; and Sugizaki, Atsushi, 4,401,788, Cl. 524-714.000.
Suhr, Gunther; Knuth, Manfred; Malchow, Wilhelm; and Homann, Thorsten, to Fried. Krupp GmbH. Worm press. 4,401,023, Cl. 100-148.000.
Sumida, Seizo: *See*—
Satomi, Takeo; Sumida, Seizo; and Yoshida, Ryo, 4,401,459, Cl. 71-94.000.
Sumitomo Bakelite Company Limited: *See*—
Kaneko, Shoroku; Yamaoka, Sigenori; Mizuno, Masuo; and Okabe, Yukihiro, 4,401,499, Cl. 156-307.300.
Sumitomo Chemical Company, Limited: *See*—
Itoh, Tadamasa, 4,401,763, Cl. 436-115.000.
Satomi, Takeo; Sumida, Seizo; and Yoshida, Ryo, 4,401,459, Cl. 71-94.000.
Sumitomo Electric Industries, Ltd.: *See*—
Doi, Yoshihiko; Hirayama, Toshikazu; Miyawaki, Yasushi; and Maruyama, Masao, 4,401,297, Cl. 266-252.000.
Kobayashi, Mitsunori; and Doi, Yoshihiko, 4,401,719, Cl. 428-457.000.
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Sumitomo Kei Kinzoku Kogyo Kabushiki Kaisha: *See*—
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,401,484, Cl. 148-131.000.
Sumitomo Light Metal Industries, Ltd.: *See*—
Yoshida, Tsutomu, 4,401,295, Cl. 266-207.000.
Summers, James W.: *See*—
Nehmey, Sam D.; and Summers, James W., 4,401,612, Cl. 264-53.000.
Street, William L.; and Summers, James W., 4,401,055, Cl. 119-14.030.
Sun Chemical Corporation: *See*—
Lupoli, Peter J., 4,401,972, Cl. 340-80.000.
Sun, Hsiang-ning, to Atlantic Richfield Company. Two step process for the preparation of zeolite A by hydrothermal treatment of heulandite. 4,401,633, Cl. 423-118.000.
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Suncor, Inc.: *See*—
Elanchenny, Vythilingam; and Seitzer, Walter H., 4,401,552, Cl. 208-11.0LE.
Sunds Defibrator, Inc.: *See*—
Reinhall, Ulf, 4,401,280, Cl. 241-247.000.
Sundstrand Corporation: *See*—
Louis, Joseph E., 4,400,935, Cl. 60-431.000.
Pollman, Frederic W., 4,401,182, Cl. 180-242.000.
Sundstrand Data Control, Inc.: *See*—
Hanson, Richard A.; and Atherton, Kim W., 4,400,979, Cl. 73-517.00B.
Supertex, Inc.: *See*—
Blanchard, Richard A., 4,402,003, Cl. 357-43.000.
Susie, William F.: *See*—
Lloyd, Raymond A.; Charles, Larry L.; Susie, William F.; Tate, Allen W., Jr.; and Reeder, James R., 4,402,055, Cl. 364-579.000.
Suttles, James M., to Mead Corporation, The. Forward feed merchandising device for soft drink bottles. 4,401,221, Cl. 211-49.00D.
Suzuki, Akio; Shiozawa, Hiroaki; Koitabashi, Takeo; and Takiguchi, Hideki, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic emulsion. 4,401,754, Cl. 430-599.000.
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,401,321, Cl. 280-804.000.
Suzuki, Nobuhiko: *See*—
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, 4,402,050, Cl. 364-460.000.
Suzuki, Tadao, to Sony Corporation. Power amplifier. 4,401,954, Cl. 330-297.000.
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Arai, Kozo; Suzuki, Takao; and Umetsu, Syozo, 4,401,489, Cl. 148-438.000.
Suzuki, Yoshiro; Yasuda, Tadahiro; Nishikawa, Masaji; Sato, Eiichi; and Aoki, Tadashi, to Olympus Optical Company Limited. Transfer device for use in retention type electrophotographic copying machine. 4,401,383, Cl. 355-3.0TR.
Svensson, Vide H.: *See*—
Melin, Ake L.; and Svensson, Vide H., 4,401,463, Cl. 75-44.00S.
Svoboda, Edward J.: *See*—
Csaszar, Gabor; Goldman, Fred M.; Oehley, Gernot; and Svoboda, Edward J., 4,401,089, Cl. 123-536.000.
Swanson, David L.; and Lyons, Dale E., to Atwood Vacuum Machine Company. Landing gear actuator. 4,400,986, Cl. 74-128.000.
Sweat, Robert H., Jr.: *See*—
Kulterman, Robert W.; Rakes, James M.; and Sweat, Robert H., Jr., 4,401,931, Cl. 318-696.000.
Swensson, Folke H. T.: *See*—
von Knorring, Enar S.; and Swensson, Folke H. T., 4,401,146, Cl. 160-319.000.
Swindal, James L.: *See*—
Grantham, Daniel H.; and Swindal, James L., 4,401,367, Cl. 350-162.220.
SWS Silicones Corporation: *See*—
Tripp, Jeffrey A., 4,401,698, Cl. 427-387.000.
Syminex [Societe Anonyme]: *See*—
Lepert, Philippe R., 4,400,980, Cl. 73-579.000.
Synfuel (an Indiana limited partnership): *See*—
Osborne, John S., 4,401,162, Cl. 166-248.000.
Syntex (U.S.A.) Inc.: *See*—
Gallop, Paul M., 4,401,797, Cl. 525-383.000.
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,401,372, Cl. 351-160.00H.
Szabo, Robert J.; and Stovin, Garfield W., to Variform Plastics, Inc. Mobile home skirting system. 4,400,919, Cl. 52-169.120.
Szala, Lawrence E.: *See*—
Lee, Minyoung; and Szala, Lawrence E., 4,401,443, Cl. 51-307.000.
Szeto, Whalun: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,401,875, Cl. 219-69.00V.
Szymborski, Joseph; Misra, Sudhansu S.; Eggers, Mark L.; and Burrows, Brian W., to GNB Batteries Inc. Sealed deep cycle lead acid battery. 4,401,730, Cl. 429-53.000.
T & R Chemicals, Inc.: *See*—
Alvarez, Jose A. A., 4,401,654, Cl. 424-162.000.
Alvarez, Jose A. A., 4,401,655, Cl. 424-162.000.
Tabata, Junichi; and Kaneko, Noboru, to Kabushiki Kaisha Daini Seikosha. Electrochromic diaplay device exhibiting uniform coloration density. 4,401,983, Cl. 340-785.000.
Tabata, Junichi; and Kaneko, Noboru, to Kabushiki Kaisha Daini Seikosha. Electrochromic display device. 4,401,984, Cl. 340-785.000.
Tabler, Donald C.: *See*—
Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., 4,401,640, Cl. 423-367.000.
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, to Honda Giken

Kogyo Kabushiki Kaisha. Apparatus for visually indicating continuous travel route of a vehicle. 4,402,050, Cl. 364-460.000.

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Tajkowski, Edward G.; and Colbert, Aaron, to Allied Corporation. Solvent based dewatering system with demulsifier. 4,401,584, Cl. 252-194.000.

Takada, Juichiro. Belt clamps for vehicle occupant restraint belt systems. 4,401,281, Cl. 242-107.200.

Takada, Yusaku: *See*—
Katayama, Hajime; Nagaoka, Tateki; Takada, Yusaku; Onoda, Shigeyoshi; Kubota, Atsushi; Hara, Hiroshi; and Suda, Masashi, 4,401,385, Cl. 355-15.000.

Takagi, Satoshi; and Watanabe, Toshio, to Clarion Co., Ltd. Magnetic recording/reproducing apparatus. 4,402,019, Cl. 360-71.000.

Takagi, Yasumasa: *See*—
Hayakawa, Nobuo; Ohashi, Yasuo; Ohta, Kenji; Takagi, Yasumasa; and Gotoh, Masami, 4,400,844, Cl. 15-250.160.

Takahashi, Ikuo: *See*—
Sano, Yukinori; Hoshi, Yoshikazu; and Takahashi, Ikuo, 4,401,076, Cl. 123-357.000.

Takahashi, Kihei; and Takeshima, Kiyoshi, to Yoshida Kogyo K. K. Woven slide fastener stringer. 4,401,138, Cl. 139-384.00B.

Takahashi, Koji: *See*—
Kamata, Yasuji; Kuwahara, Hiroshi; Ide, Jushi; Yamashita, Kenkichi; and Takahashi, Koji, 4,401,922, Cl. 315-368.000.

Takahashi, Seiichi: *See*—
Iijima, Tetsuya; and Takahashi, Seiichi, 4,401,149, Cl. 165-2.000.

Takahashi, Tsuneo: *See*—
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, 4,402,050, Cl. 364-460.000.

Takahashi, Yasuo: *See*—
Kasuya, Katsuhiko; Fujiwara, Mitsuru; Imai, Masaya; Matsunaga, Tetsuzo; and Takahashi, Yasuo, 4,401,420, Cl. 418-201.000.

Takamura, Yoshio: *See*—
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,401,902, Cl. 307-415.000.

Takano, Toshio; Mihashi, Kazutaka; and Arasawa, Kohichi, to Fuji Jukogyo Kabushiki Kaisha. Electro-magnetic clutch control system for automobiles. 4,401,199, Cl. 192-0.052.

Takaoka, Tokuro: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, 4,401,180, Cl. 180-148.000.

Takasaki, Masaru: *See*—
Ohashi, Toshio; Muto, Yoshihiko; and Takasaki, Masaru, 4,401,013, Cl. 98-2.110.

Takata, Tadahiko, to Teijin Limited. Polyester fiber composite material useful for reinforcing rubber articles and process for producing the same. 4,401,713, Cl. 428-290.000.

Takeda Riken Kogyo Kabushiki Kaisha: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimizu, Masao, 4,402,081, Cl. 371-21.000.

Takei, Hideaki, to Xerox Corporation. Optical scanning system utilizing light-emitting diodes. 4,402,017, Cl. 358-293.000.

Takemoto, Masahiro: *See*—
Shimmura, Shuzaburo; Hakamata, Tokuichi; and Takemoto, Masahiro, 4,401,094, Cl. 123-576.000.

Takenaka, Kiyoshi: *See*—
Yamada, Kenichi; Yokogawa, Seiji; Fujita, Shigehiko; Takenaka, Kiyoshi; and Tanoue, Koichi, 4,401,328, Cl. 289-2.000.

Takeshima, Kiyoshi: *See*—
Takahashi, Kihei; and Takeshima, Kiyoshi, 4,401,138, Cl. 139-384.00B.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Ishii, Shinichi; Saino, Tetsushi; and Someno, Tetsuya, 4,401,594, Cl. 260-112.50R.

Takeuchi, Yasuhisa: *See*—
Noso, Kazunori; Yano, Hiroshi; Kishi, Norimasa; and Takeuchi, Yasuhisa, 4,401,852, Cl. 179-1.0VC.

Takiguchi, Hideki: *See*—
Suzuki, Akio; Shiozawa, Hiroaki; Koitabashi, Takeo; and Takiguchi, Hideki, 4,401,754, Cl. 430-599.000.

Takizawa, Tozo: *See*—
Minegishi, Sokichi; Takizawa, Tozo; Kawamura, Hideo; and Sagawa, Nobukazu, 4,401,065, Cl. 123-145.00A.

Tamamura, Hideo; and Nagata, Toru, to Canon Kabushiki Kaisha. Film feeding device for camera. 4,401,379, Cl. 354-214.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,401,820, Cl. 548-344.000.

Tanahashi, Toshio: *See*—
Ito, Sumio; Kumai, Teruo; Oki, Hisashi; and Tanahashi, Toshio, 4,401,072, Cl. 123-292.000.

Tanaka, Akira: *See*—
Sato, Takayuki; and Tanaka, Akira, 4,401,846, Cl. 174-149.00B.

Tanaka, Etsuo: *See*—
Sato, Akihiko; Nakano, Yoshiyuki; and Tanaka, Etsuo, 4,401,380, Cl. 354-246.000.

Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Saito, Norio; and Sasaoka, Michio, 4,401,528, Cl. 204-78.000.

Tanaka, Kiichiro: *See*—
Okamura, Yasushi; and Tanaka, Kiichiro, 4,402,071, Cl. 369-67.000.

Tanaka, Masato: *See*—
Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, 4,402,021, Cl. 360-72.200.

Tanaka, Masatoshi: *See*—
Sakamoto, Fukuma; Isshiki, Isao; Tanaka, Masatoshi; and Satoh, Koji, 4,402,087, Cl. 382-53.000.

Tanaka, Susumu, to Sansui Electric Co., Ltd. Bias circuit for use in a single-ended push-pull circuit. 4,401,951, Cl. 330-268.000.

Tanaka, Takeji: *See*—
Iwaki, Takashi; and Tanaka, Takeji, 4,400,929, Cl. 53-580.000.

Tanaka, Yasunari: *See*—
Saito, Tadashi; Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; Iwasaki, Syunji; Higuchi, Shigemitsu; Ozawa, Hiroshi; and Tanaka, Yasunari, 4,401,971, Cl. 340-52.00F.

Tang, Lucia C.; and Troyer, Margaret A., to United States of America, Congress. Method of stabilizing felted cellulosic sheet material with an alkali metal borohydride. 4,401,810, Cl. 536-56.000.

Tanger, Charles M., to Rohm and Haas Company. Process for preparing phenoxybenzoic acids. 4,401,828, Cl. 560-21.000.

Taniguchi, Hiroyuki: *See*—
Momma, Naohiro; and Taniguchi, Hiroyuki, 4,402,001, Cl. 357-38.000.

Tanoue, Koichi: *See*—
Yamada, Kenichi; Yokogawa, Seiji; Fujita, Shigehiko; Takenaka, Kiyoshi; and Tanoue, Koichi, 4,401,328, Cl. 289-2.000.

Tarasov, Arthur, to Warner-Lambert Company. Method for preparing small sized benzoyl peroxide crystals. 4,401,835, Cl. 568-559.000.

Tassicker, Owen J., to Electric Power Research Institute, Inc. Method and means for measuring particulate matter on a filter. 4,400,971, Cl. 73-28.000.

Tate, Allen W., Jr.: *See*—
Lloyd, Raymond A.; Charles, Larry L.; Susie, William F.; Tate, Allen W., Jr.; and Reeder, James R., 4,402,055, Cl. 364-579.000.

Tateishi, Hideki: *See*—
Abe, Katsuo; Kobayashi, Shigeru; Kamei, Tsuneaki; Tateishi, Hideki; and Aiuchi, Susumu, 4,401,539, Cl. 204-192.00R.

Tatsuguchi, Kazuo: *See*—
Wada, Yoshiyo; Kinjo, Hisao; Ozawa, Keiji; Tatsuguchi, Kazuo; Goto, Kunio; and Hirata, Atsumi, 4,402,018, Cl. 358-342.000.

Tatum, Joe F.; and Lewis, Thomas H., to C.E. Equipment Co., Inc. Apparatus for reducing end effect in anodes. 4,401,540, Cl. 204-196.000.

Taub, David: *See*—
Patchett, Arthur A.; and Taub, David, 4,401,676, Cl. 424-309.000.

Taylor, Alwyn H.: *See*—
Moses, Peter R.; Taylor, Alwyn H.; and Turchan, Michael J., 4,401,735, Cl. 429-195.000.

Taylor, David L., to Harris Corporation. Integrated RAM/EAROM memory system. 4,402,065, Cl. 365-189.000.

Taylor, Derek R., to Mastiff Security Systems Limited. Radio transmitter for repeated bursts of oscillations. 4,401,977, Cl. 340-539.000.

Taylor, Rebecca S.; and Pavlo, John A., to Kendall Company, The. Stethoscope securing pad. 4,401,125, Cl. 128-715.000.

Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, to Canadian Patents & Development Limited. Laser triggered high voltage rail gap switch. 4,401,920, Cl. 315-150.000.

Tazoe, Masaaki: *See*—
Fujiwara, Akiko; Hoshino, Tatsuo; and Tazoe, Masaaki, 4,401,812, Cl. 536-6.400.

TDK Electronics Co., Ltd.: *See*—
Watanabe, Akio; Ide, Tosiaki; and Uehori, Tatsuo, 4,401,462, Cl. 75-0.5BA.

Tebaldi, Jacques. Tongs having a removable absorbent lining for drying the handles of tennis rackets and similar. 4,400,892, Cl. 34-95.100.

Technicare Corporation: *See*—
Gardineer, Bayard G.; and Heringes, James A., 4,401,882, Cl. 219-335.000.
Guess, Joe F.; Dietz, Dennis R.; and Hottinger, Charles F., 4,401,124, Cl. 128-660.000.

Technicon Instruments Corporation: *See*—
Smith, David S., 4,401,764, Cl. 436-500.000.

Teijin Limited: *See*—
Takata, Tadahiko, 4,401,713, Cl. 428-290.000.

Teitscheid, Heinz-Horst: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,401,751, Cl. 430-375.000.

Tele-Drill Inc,: *See*—
Goiffon, John J.; and Thawley, S. Tom, 4,400,858, Cl. 24-255.0BS.

Teller, Aaron J., to Teller Enviromental Systems, Inc. Process for removing particulates from gas with liquid particulate condensation. 4,401,444, Cl. 55-20.000.

Teller Enviromental Systems, Inc.: *See*—
Teller, Aaron J., 4,401,444, Cl. 55-20.000.

Tellier, Jacques; Sirvins, Andre; Gautier, Jean-Claude; and Tramier, Bernard, to Societe Nationale Elf Aquitaine (Production). Process of culturing microorganisms using a microemulsion. 4,401,762, Cl. 435-243.000.

Tenneco Polymers, Inc.: *See*—
Ceprini, Mario Q.; Goodman, Donald; and Hoch, Samuel, 4,401,798, Cl. 526-84.000.

Terai, Yasuharu: *See*—
Matsuzaki, Kenji; Horino, Akio; Terai, Yasuharu; and Kato, Shohei, 4,401,309, Cl. 280-5.00A.
Terakura, Yukio: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,400,989, Cl. 74-467.000.
Teraslinna, Kari T., to Bell Telephone Laboratories, Incorporated. Wideband switching architecture. 4,402,008, Cl. 358-86.000.
ter Jung, Hermann; Reihs, Leonhard; and Roh, Gerhard, to Hoechst Aktiengesellschaft. Process for the manufacture of polyvinyl alcohol by alcoholysis of a polyvinyl ester. 4,401,790, Cl. 525-62.000.
Terumo Corporation: *See*—
Igari, Akira; and Murakami, Tsutomu, 4,401,566, Cl. 210-351.000.
Terunuma, Hiroshi: *See*—
Kimura, Makoto; and Terunuma, Hiroshi, 4,401,374, Cl. 354-25.000.
Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,401,601, Cl. 260-464.000.
Martel, Jacques; Tessier, Jean; and Girault, Pierre, 4,401,673, Cl. 424-263.000.
Tetra Pak Developpement SA: *See*—
Ignell, Rolf L., 4,400,862, Cl. 29-421.00R.
Tetra Pak International AB: *See*—
Carlsson, Lars, 4,401,250, Cl. 226-33.000.
Glans, Jan-Erik; and Martensson, Arvid, 4,401,004, Cl. 83-875.000.
Texaco Inc.: *See*—
Cox, Percy T., 4,401,947, Cl. 324-338.000.
Texas Instruments Incorporated: *See*—
Guttag, Karl M., 4,402,042, Cl. 364-200.000.
Guttag, Karl M.; McDonough, Kevin C.; and Laws, Gerald E., 4,402,043, Cl. 364-200.000.
Islam, Safidul, 4,400,870, Cl. 29-588.000.
McDonough, Kevin C.; and Guttag, Karl M., 4,402,044, Cl. 364-200.000.
Shukla, Vishwa N.; and Kulwicki, Bernard M., 4,401,879, Cl. 219-206.000.
Streckmann, George L.; and Yancy, Jerry W., 4,401,360, Cl. 350-96.150.
Trenkler, George; and Cooper, Lawrence E., 4,401,986, Cl. 340-870.320.
White, Lionel S., Jr.; and Hong, Ngai H., 4,401,904, Cl. 307-482.000.
Th. Goldschmidt AG: *See*—
Ruf, Erich, 4,401,525, Cl. 204-42.000.
Thawley, S. Tom: *See*—
Goiffon, John J.; and Thawley, S. Tom, 4,400,858, Cl. 24-255.0BS.
Theuwis, Alfons L. M. C., to Electro-Nite Co. Measuring probe for taking a sample from a metal bath and for measuring the bath temperatures. 4,401,389, Cl. 374-140.000.
Thiaud, Jacques: *See*—
Cupuis, Bernard; and Thiaud, Jacques, 4,402,074, Cl. 370-14.000.
Thiel, Rudolf: *See*—
Reinartz, Hans-Dieter; and Thiel, Rudolf, 4,400,942, Cl. 60-547.100.
Thiokol Corporation: *See*—
Salamone, Ann B., 4,401,650, Cl. 424-78.000.
Thoma, Wilhelm: *See*—
Pedain, Josef; Thoma, Wilhelm; Grammel, Jurgen; and Schroer, Walter, 4,401,801, Cl. 528-67.000.
Thomas, Hermann; and Jakob, Hans, to Maschinenfabrik Goebel GmbH. Zigzag folding apparatus having means for decreasing inertial forces during reciprocation. 4,401,428, Cl. 493-415.000.
Thomas Jefferson University: *See*—
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,401,108, Cl. 128-1.100.
Thomassen Holland B. V.: *See*—
Alink, Aloysius J. W. O., 4,401,440, Cl. 48-61.000.
Thomassen, Johan H. C., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V. Transport and dispensing container for liquid material. 4,401,239, Cl. 222-183.000.
Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, to Societe de'Etudes Scientifiques et Industrielles de l'Ile-de France. Derivatives of 4-amino-5-alkyl sulphonyl orthoanisamides. 4,401,822, Cl. 548-567.000.
Thompson, Corey M., to Data General Corporation. Adjustable optical mirror mount. 4,401,288, Cl. 248-476.000.
Thompson, H. Lytle; and Kaplan, Milton L., to UOP Inc. Hydrotreating process with ammonia injection to reaction zone effluent. 4,401,561, Cl. 208-212.000.
Thompson, Hugh A. Solar energy conversion apparatus. 4,401,103, Cl. 126-419.000.
Thompson, John S., to FMC Corporation. Carbohydrate food products resistant to *Clostridium botulinum* and the formation of enterotoxin. 4,401,683, Cl. 426-331.000.
Thomson-CSF: *See*—
Ravinet, Pierre; and Micheron, Francois, 4,401,911, Cl. 310-800.000.
Setbon, Raoul, 4,402,086, Cl. 378-112.000.
Thomson-CSF Telephone: *See*—
Athenes, Claude; and Salle, Jacques E., 4,402,078, Cl. 370-66.000.
Thorn Cascade Company Limited: *See*—
Child, Robert P.; and Charles, Barry G., 4,401,607, Cl. 261-121.00R.
Thorn Emi Domestic Electrical Appliances Limited: *See*—
Adams, Francis J.; Child, Robert P.; and Charles, Barry G., 4,401,016, Cl. 99-323.100.
Thornton, Donald I.: *See*—
Peyton, Richard H.; and Thornton, Donald I., 4,400,864, Cl. 29-508.000.
Thornton, Robert K., to United Technologies Corporation. System for measuring cable footage. 4,400,882, Cl. 33-127.000.
Thumm, Helmut; Bahr, Theodor; and Henrich, Hans, to J. M. Voith GmbH. Apparatus for producing mechanical wood pulp. 4,401,277, Cl. 241-38.000.
Thuy, M. N'Guyen U., to Societe CEM-Compagnie Electromecanique & CIE SNC. Process and device to control the electric braking of a direct current motor. 4,401,927, Cl. 318-379.000.
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Chiang, Peter T.; and Tiepel, Erich W., 4,401,628, Cl. 423-15.000.
Timex Corporation: *See*—
Mearns, Alec R., 4,401,388, Cl. 368-282.000.
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Zamiska, Frank P.; and Tipton, Norman B., 4,401,542, Cl. 204-213.000.
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Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,401,799, Cl. 526-142.000.
Toho Belson Co., Ltd.: *See*—
Saito, Kazuhisa; Ogawa, Hiroyasu; and Shigei, Tetsuro, 4,401,533, Cl. 204-130.000.
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Nakane, Hisashi; Kanai, Wataru; and Tsuda, Minoru, 4,401,745, Cl. 430-197.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aoyagi, Akira; Sakata, Kazuomi; Ikeda, Shinichi; and Koyama, Mashiro, 4,400,981, Cl. 73-862.510.
Iizuka, Tetsuya, 4,401,903, Cl. 307-449.000.
Iwasaki, Masami, 4,402,004, Cl. 357-79.000.
Nitta, Tsuneo; Murata, Toshitake; Tsuboi, Hiroyuki; and Kondo, Takashi, 4,401,851, Cl. 179-1.0SD.
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,401,902, Cl. 307-415.000.
Otsuka, Hideo, 4,401,506, Cl. 156-612.000.
Saito, Tamio, 4,401,881, Cl. 219-216.000.
Sato, Takayuki; and Tanaka, Akira, 4,401,846, Cl. 174-149.00B.
Tomioka, Hirotaka: *See*—
Hirabayashi, Hirokazu; Tomioka, Hirotaka; and Yamagata, Shuji, 4,401,341, Cl. 296-185.000.
Tomy Kogyo Co., Inc.: *See*—
Hamano, Nobuo, 4,401,304, Cl. 273-85.00G.
Sano, Hiroshi, 4,401,305, Cl. 273-86.00F.
Torbica, Ratko; and Bertok, Vladimir, to Tovarna Motornih Vozil Tomos Koper, n.sol.o. Self-priming centrifugal pump. 4,401,409, Cl. 415-211.000.
Torel, Inc.: *See*—
Dickinson, Jane H.; and Clark, Leebert D., 4,401,246, Cl. 224-150.000.
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Saito, Norio; and Sasaoka, Michio, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing 2-oxycephalosporin derivatives. 4,401,528, Cl. 204-78.000.
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Rhodes, Buck A.; and Torvestad, David, 4,401,646, Cl. 424-1.000.
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Kawabata, Toshiyasu; Tosaka, Hachiro; and Nanya, Toshiki, 4,401,740, Cl. 430-102.000.
Tosco Corporation: *See*—
Faudel, Gerald B., 4,401,553, Cl. 208-11.00R.
Toshimitsu, Yoshihiko: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Aoyama, Toshihiko; Takaoka, Tokuro; Aoki, Takashi; and Sato, Yoichi, 4,401,180, Cl. 180-148.000.
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Torbica, Ratko; and Bertok, Vladimir, 4,401,409, Cl. 415-211.000.
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Berke, Neal S.; and Townsend, Herbert E., 4,401,727, Cl. 428-610.000.
Toyo Kogyo Co., Ltd.: *See*—
Chihara, Takeshi; and Gokimoto, Hiroyuki, 4,401,344, Cl. 297-367.000.
Toyo Kogyo Co., Ltd: *See*—
Nakamoto, Hiromasa; and Mentuni, Akiyoshi, 4,400,954, Cl. 70-186.000.
Toyo Seikan Kaisha Ltd.: *See*—
Kitamura, Yoichi; Ito, Makoto; and Yurita, Chikara, 4,401,874, Cl. 219-64.000.
Toyoda, Minoru: *See*—
Ishii, Eiichi; Mori, Yoshiaki; and Toyoda, Minoru, 4,401,885, Cl. 219-523.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ito, Sumio; Kumai, Teruo; Oki, Hisashi; and Tanahashi, Toshio, 4,401,072, Cl. 123-292.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Aoki, Keiji; and Ikeda, Shinji, 4,401,079, Cl. 123-435.000.

Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,400,989, Cl. 74-467.000.
Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.
Kato, Kiyoshi; Kondo, Yasuo; Kuwakado, Satosi; and Kakeno, Nobuhiko, 4,401,078, Cl. 123-376.000.
Kato, Yoshito; Matsubara, Hideyuki; and Hashimoto, Toshio, 4,401,930, Cl. 318-603.000.
Kawaguchi, Hiroshi; and Nishina, Shuho, 4,401,347, Cl. 303-6.00C.
Miura, Kazuhiko; Kawabata, Takakazu; Hattori, Tadashi; and Ueno, Yoshiki, 4,401,948, Cl. 324-378.000.
Miyagi, Hideo, 4,401,086, Cl. 123-489.000.
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, 4,401,321, Cl. 280-804.000.
Tsuchida, Takashi; Okada, Kazukiyo; Okuda, Yutaka; Kondo, Nobuo; and Shinohara, Toshio, 4,402,048, Cl. 364-442.000.

Toystalgia, Incorporated: *See*—
Knutson, Darryl C., 4,401,259, Cl. 232-4.00R.

Tramier, Bernard: *See*—
Tellier, Jacques; Sirvins, Andre; Gautier, Jean-Claude; and Tramier, Bernard, 4,401,762, Cl. 435-243.000.

Tramontini, Vernon N., to Stewart-Warner Corporation. Vacuum brazing process with improved gettering. 4,401,254, Cl. 228-217.000.

Trend Products Company: *See*—
Feld, Gerald M., 4,401,017, Cl. 99-413.000.

Trenkler, George; and Cooper, Lawrence E., to Texas Instruments Incorporated. Position sensor and system. 4,401,986, Cl. 340-870.320.

Trilog, Inc.: *See*—
Melissa, Raymond F.; Grummett, Lorne H.; and Fischer, Joseph J., 4,401,390, Cl. 400-240.300.

Tripp, Jeffrey A., to SWS Silicones Corporation. Hydrophilic coatings for textile materials. 4,401,698, Cl. 427-387.000.

Trosky, William J.; and Buros, Michael C., to Westinghouse Electric Corp. Method of evaluating the performance of an elevator system. 4,401,192, Cl. 187-29.00R.

Troyer, Margaret A.: *See*—
Tang, Lucia C.; and Troyer, Margaret A., 4,401,810, Cl. 536-56.000.

TS Leasing Associates: *See*—
Ghiringhelli, Hugh A., 4,401,586, Cl. 252-378.00R.

Tschudin-Mahrer, Rolf, to Irbit Holding AG. Foam strip wound up into a roll, preferably for sealing purposes. 4,401,716, Cl. 428-317.300.

Tseng, Tsiung-Siung. Cargo securing fitting. 4,400,856, Cl. 24-221.00R.

Tsien, Grace: *See*—
Giacobbe, Thomas J.; and Tsien, Grace, 4,401,623, Cl. 422-1.000.

Tsubai, Yasuo: *See*—
Senga, Takao; Koishi, Masafumi; and Tsubai, Yasuo, 4,401,739, Cl. 430-16.000.

Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Inc. Curable resin composition comprising N-(alkenylphenyl)maleimide and epoxy composition. 4,401,777, Cl. 523-451.000.

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Nitta, Tsuneo; Murata, Toshitake; Tsuboi, Hiroyuki; and Kondo, Takashi, 4,401,851, Cl. 179-1.0SD.

Tsuchida, Takashi; Okada, Kazukiyo; Okuda, Yutaka; Kondo, Nobuo; and Shinohara, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Method of and apparatus for indicating remaining fuel quantity for vehicles. 4,402,048, Cl. 364-442.000.

Tsuchiya, Kazuo; Masuda, Hirotsugu; and Sakaguchi, Yuji, to Bridgestone Tire Co., Ltd. Flexible pipe coupling. 4,401,325, Cl. 285-231.000.

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Nakane, Hisashi; Kanai, Wataru; and Tsuda, Minoru, 4,401,745, Cl. 430-197.000.

Tsunoda, Masakazu, to Nissan Motor Company, Limited. Voice warning system for an automotive vehicle. 4,401,848, Cl. 179-1.0SM.

Tuckey, Charles H., to Walbro Corporation. Self-contained rotary fuel pump. 4,401,416, Cl. 417-283.000.

Tuggle, Gordon P. Integrated dimorphic structure. 4,400,926, Cl. 52-646.000.

Tulli, Telesforo. Television line antenna apparatus. 4,401,989, Cl. 343-905.000.

Tullis, Richard H.: *See*—
Rubin, Harvey; and Tullis, Richard H., 4,401,759, Cl. 435-91.000.

Tultex Corporation: *See*—
Morrison, Willard L., 4,401,712, Cl. 428-289.000.

Turchan, Michael J.: *See*—
Moses, Peter R.; Taylor, Alwyn H.; and Turchan, Michael J., 4,401,735, Cl. 429-195.000.

Turner, John J. P., to Du Pont de Nemours, E. I., and Company. Manufacture of activated carbon fabric. 4,401,588, Cl. 252-421.000.

Tyke, Charles R.: *See*—
Kulikowski, Patricia A.; Palmbos, Allen L.; and Tyke, Charles R., 4,401,222, Cl. 211-94.000.

Tympanium Corporation: *See*—
van Opijnen, L. J. K., 4,401,936, Cl. 320-59.000.

UBE Industries, Ltd.: *See*—
Umumura, Sumio; Iwata, Fumio; Ataka, Kikuo; and Shiraishi, Hiroshi, 4,401,830, Cl. 562-478.000.

Uchikune; Tagami, Mutsukazu; Shimizu, Taketo; Yanagisawa, Kiyoshi; Yokosawa, Katsuto; Horiuchi, Kunio; and Sakaguchi, Hiroo, to Kanetsu Kogyo Kabushiki Kaisha. Magnet assembly. 4,401,960, Cl. 335-285.000.

Udren, Eric A., to Electric Power Research Institute, Inc. Protective relay methods and apparatus. 4,402,028, Cl. 361-36.000.

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Watanabe, Akio; Ide, Tosiaki; and Uehori, Tatsuo, 4,401,462, Cl. 75-0.5BA.

Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Titanium trichloride catalyst and process for the production thereof. 4,401,799, Cl. 526-142.000.

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Miura, Kazuhiko; Kawabata, Takakazu; Hattori, Tadashi; and Ueno, Yoshiki, 4,401,948, Cl. 324-378.000.

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Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.

Uhde GmbH: *See*—
Marsch, Hans-Dieter; and Briecke, Hans-Gunther, 4,401,153, Cl. 165-134.00R.

Umeda, Ikuo: *See*—
Aiba, Masahiko; Yamamoto, Yoichi; Iwai, Hiroji; and Umeda, Ikuo, 4,401,990, Cl. 346-75.000.

Umetsu, Syozo: *See*—
Arai, Kozo; Suzuki, Takao; and Umetsu, Syozo, 4,401,489, Cl. 148-438.000.

Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Ishii, Shinichi; Saino, Tetsushi; and Someno, Tetsuya, to Nippon Kayaku Kabushiki Kaisha. L-Argininal derivatives and a method of manufacturing the same. 4,401,594, Cl. 260-112.50R.

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Union Carbide Corporation: *See*—
Bezman, Richard D.; and Rabo, Jule A., 4,401,556, Cl. 208-111.000.
Fritz, Charles D.; Evans, Wilbur E.; and Cooke, Anson R., 4,401,454, Cl. 71-76.000.
La Clair, Louis M., 4,401,448, Cl. 62-22.000.
Royal, John H.; Graczyk, Lawrence S.; and Owens, William J., 4,401,155, Cl. 165-166.000.
Videueira, Jose A.; Forte, Paulino; and Butwell, Kenneth F., 4,401,560, Cl. 208-324.000.

Uniroyal, Inc.: *See*—
Ahnemiller, James, 4,401,771, Cl. 521-121.000.

Unisearch Limited (N.S.W.)Australia: *See*—
Garnett, John L.; Schwarz, Thomas; and Fletcher, Grant, 4,401,688, Cl. 427-43.100.

United States of America
Administrator National Aeronautics and Space Administration: *See*—
Liu, James K.; Schwuttke, Guenter H.; and Koliwad, Krishna M., 4,401,505, Cl. 156-608.000.
Agriculture: *See*—
Connick, William J., Jr., 4,401,456, Cl. 71-88.000.
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., 4,400,983, Cl. 74-25.000.
Army: *See*—
Gray, Jack, 4,402,049, Cl. 364-447.000.
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,401,670, Cl. 424-250.000.
Rittenbach, Otto E.; and Olesch, Reinhard G., 4,401,980, Cl. 340-666.000.
Congress: *See*—
Tang, Lucia C.; and Troyer, Margaret A., 4,401,810, Cl. 536-56.000.
Energy: *See*—
Otto, Neil C.; Warner, Barry T.; Smaga, John A.; and Battles, James E., 4,401,714, Cl. 429-221.000.
Environmental Protection Agency: *See*—
Bell, John P., 4,400,982, Cl. 73-863.220.
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Madsen, Brent W.; Dolezal, Henry; Bloom, Philip A.; and Shirts, Monte B., 4,401,632, Cl. 423-87.000.
National Aeronautics and Space Administration: *See*—
Adams, William A.; and Reinhardt, Victor S., 4,401,953, Cl. 330-289.000.
Dolland, Carlisle R.; and Bailey, David A., 4,401,934, Cl. 318-798.000.
Navy: *See*—
Bailey, Milton; Spindola, Kenneth; and Bernstein, Sumner H., 4,401,707, Cl. 428-166.000.
Burdette, George W.; and Schneider, Abraham I., 4,401,837, Cl. 585-253.000.
Kaloi, Cyril M., 4,401,988, Cl. 343-700.0MS.
Miller, Howard A.; and Nichols, Charles S., 4,402,069, Cl. 367-154.000.

U.S. Philips Corporation: *See*—
Buzzi, Leo; and Bukoschek, Romuald L., 4,400,875, Cl. 30-43.920.
Carasso, Marino G.; Cornelissen, Bernardus H. J.; and van Santen, Johannes G., 4,402,014, Cl. 358-217.000.
Frank, Gunter; Kostlin, Heiner; Sprengers, Leo M.; and Campbell, Ronald J., 4,401,693, Cl. 427-160.000.
Gerritsen, Jan, 4,401,917, Cl. 313-413.000.
Glenny, Alfred E. T.; van Vliet, Johannes A. J. M.; and Weerdesteijn, Petrus A. M., 4,401,916, Cl. 313-628.000.
Krol, Thijs, 4,402,045, Cl. 364-200.000.

Steers, Michel; and Hazan, Jean-Pierre. 4,400,838, Cl. 8-158.000.
Vorst, Henricus H. M.; Bastiaens, Jozef J. J.; and Munk, Enno C., 4,401,992, Cl. 346-76.00L.
Wesselink, Gustaaf A.; Roelofs, Hendrik; and Van Bommel, Cornelis H. M., 4,401,914, Cl. 313-111.000.

U.S. Solar Corporation: *See—*
Farber, Webb W., 4,400,847, Cl. 16-223.000.

United Technologies Corporation: *See—*
Arrigoni, John P., 4,400,915, Cl. 51-217.00R.
Eiler, Donald C., 4,401,269, Cl. 239-265.170.
Grantham, Daniel H.; and Swindal, James L., 4,401,367, Cl. 350-162.220.
Strangman, Thomas E., 4,401,697, Cl. 427-250.000.
Thornton, Robert K., 4,400,882, Cl. 33-127.000.

Universal Research Labpratories, Incorporated: *See—*
Droira, Diego I.; and Sikorski, Richard J., 4,401,234, Cl. 221-92.000.

University of CA, The Regents of the: *See—*
Krohn, Kenneth A.; Vera, David R.; and Stadalnik, Robert C., 4,401,647, Cl. 424-1.500.

University of California, The Regents of the: *See—*
Broderson, Robert W.; Hurst, Paul J.; and Fellman, Ronald D., 4,401,855, Cl. 179-15.55R.

University of Delaware, The: *See—*
Baron, Bill N.; Rocheleau, Richard E.; and Russell, T. W. Fraser, 4,401,052, Cl. 118-718.000.

University of Minnesota, Regents of the: *See—*
Portoghese, Philip S., 4,401,672, Cl. 424-260.000.

University of Waterloo: *See—*
Young, Murray M., 4,401,680, Cl. 426-53.000.

University Patents, Inc.: *See—*
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,401,534, Cl. 264-138.000.
Rhodes, Buck A.; and Torvestad, David, 4,401,646, Cl. 424-1.000.

Unsworth, William; King, John F.; and Bradshaw, Stephen L., to Magnesium Elektron Limited. Magnesium alloys. 4,401,621, Cl. 420-403.000.

UOP Inc.: *See—*
Arena, Blaise J., 4,401,823, Cl. 549-356.000.
Rosen, Bruce I., 4,401,639, Cl. 423-365.000.
Thompson, H. Lytle; and Kaplan, Milton L., 4,401,561, Cl. 208-212.000.
Urban, Peter, 4,401,549, Cl. 208-8.0LE.
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Upeslacis, Janis: *See—*
Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,401,661, Cl. 424-180.000.

Upjohn Company, The: *See—*
Aristoff, Paul A., 4,401,824, Cl. 549-385.000.
Manis, Jack J.; and Highlander, Sarah K., 4,401,761, Cl. 435-172.000.
Walker, Jerry A.; and Hessler, Edward J., 4,401,599, Cl. 260-397.450.

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Ushihara, Masaharu; Nagahiro, Michinori; Yamazaki, Humio; Nakagawa, Masami; Miyaji, Noboru; and Maruno, Susumu, to Matsushita Electric Industrial Co., Ltd. Magnetic fluid recording apparatus. 4,401,998, Cl. 346-140.00R.

USM Corporation: *See—*
Hartshorn, Frank; le Vesconte, Ivor J. R.; Murphy, Brian J. M.; and Storer, Richard E., 4,400,839, Cl. 12-12.500.

Vaes, Jos A.; and De Prijcker, Jozef P., to Agfa-Gevaert N.V. Photographic silver halide material for use in the silver complex diffusion transfer reversal process with two silver halide layers. 4,401,753, Cl. 430-502.000.

Valentin, Bernard; and Heinl, Ernst. Electrical switch with sliding contacts. 4,401,862, Cl. 200-11.00K.

Valeo: *See—*
Cadars, Patrick, 4,401,157, Cl. 165-173.000.
Jeanson, Rene H., 4,400,896, Cl. 37-67.000.

Valeron Corporation, The: *See—*
Juengel, Richard O., 4,401,945, Cl. 324-207.000.

Van Bommel, Cornelis H. M.: *See—*
Wesselink, Gustaaf A.; Roelofs, Hendrik; and Van Bommel, Cornelis H. M., 4,401,914, Cl. 313-111.000.

Vanderhoff Communications Ltd.: *See—*
Hammond, Gerald C., 4,402,073, Cl. 370-9.000.

Van Gilst, Carl W., to Chore-Time Equipment, Inc. Hog feeder. 4,401,057, Cl. 119-51.00R.

Van Loghem, Johannes J.; and La Grouw, Johannes. Building constructions. 4,400,925, Cl. 52-471.000.

van Ommering, Gerrit: *See—*
Meyer, Theodore O.; and van Ommering, Gerrit, 4,401,734, Cl. 429-181.000.

van Opijnen, L. J. K., to Tympanium Corporation. Protection system for series regulator. 4,401,936, Cl. 320-59.000.

Van Patten, Charles E. Ladder platform accessory. 4,401,187, Cl. 182-121.000.

van Santen, Johannes G.: *See—*
Carasso, Marino G.; Cornelissen, Bernardus H. J.; and van Santen, Johannes G., 4,402,014, Cl. 358-217.000.

Van Tassel, Jeffrey B.: *See—*
Salmond, Andrea; St. John, Patricia; Luebke, Randall A.; and Van Tassel, Jeffrey B., 4,401,209, Cl. 206-5.000.

van Vliet, Johannes A. J. M.: *See—*
Glenny, Alfred E. T.; van Vliet, Johannes A. J. M.; and Weerdesteijn, Petrus A. M., 4,401,916, Cl. 313-628.000.

Varian Associates, Inc.: *See—*
Antypas, George A.; Bell, Ronald L.; and Moon, Ronald L., 4,400,868, Cl. 29-572.000.

Variform Plastics, Inc.: *See—*
Szabo, Robert J.; and Stovin, Garfield W., 4,400,919, Cl. 52-169.120.

Vaudreuil, Richard E., to G & S Screw Machine Products, Inc. Knife blade holder. 4,400,878, Cl. 30-329.000.

Vera, David R.: *See—*
Krohn, Kenneth A.; Vera, David R.; and Stadalnik, Robert C., 4,401,647, Cl. 424-1.500.

Verboom, Pieter, to IHC Holland N.V. Drag head for a hopper suction dredge. 4,400,895, Cl. 37-58.000.

Verbruggen, Martin W., to Procter & Gamble Company, The. Concentrated fabric softening composition. 4,401,578, Cl. 252-8.800.

Vereinigte Deutsch Metallwerke AG: *See—*
Prinz, Bruno; Rockel, Manfred B.; Rudolph, Gunther; Heubner, Ulrich; and Zoebe, Hugo, 4,401,488, Cl. 148-435.000.

Vereinigte Edelstahlwerke AG (VEW): *See—*
Kanzler, Walter; and Schedler, Johannes, 4,401,514, Cl. 203-15.000.

Versluys, Jan P., to Australian Hop Marketers Pty. Ltd. Preservation of hops utilizing ascorbic acid. 4,401,684, Cl. 426-546.000.

Victor Company of Japan, Ltd.: *See—*
Hiraguri, Seisuke, 4,402,023, Cl. 360-77.000.
Hirota, Akira; and Hiraguri, Seisuke, 4,402,022, Cl. 360-77.000.
Sugiyama, Hiroyuki; Kaneda, Isami; Sakakibara, Susumu; Abe, Ryozo; and Sano, Yasushi, 4,402,070, Cl. 369-43.000.
Wada, Yoshiyo; Kinjo, Hisao; Ozawa, Keiji; Tatsuguchi, Kazuo; Goto, Kunio; and Hirata, Atsumi, 4,402,018, Cl. 358-342.000.

Victor United, Inc.: *See—*
Simonds, Gary; and McKee, Arnold D., 4,401,097, Cl. 124-23.00R.

Vidueira, Jose A.; Forte, Paulino; and Butwell, Kenneth F., to Union Carbide Corporation. Process for the separation of aromatic hydrocarbons from petroleum fractions with heat recovery. 4,401,560, Cl. 208-324.000.

Villeroy & Boch Keramische Werke KG: *See—*
Buchler, Ingrid, 4,401,258, Cl. 229-92.800.

Vissers, Hermanus H.; and Mijnders, Gijsbert J., to Multinorm, B.V. Device for baling agricultural crop. 4,401,022, Cl. 100-100.000.

Vitonis, Frank. Dusting brush assembly for venetian blinds and the like. 4,400,842, Cl. 15-247.000.

Vogel, Karl, to Degussa Aktiengesellschaft. Filler valve for valve bag. 4,401,140, Cl. 141-68.000.

Vogelhuber, Peter; and Wysk, Hans-Joachim, to Kienzle Apparate GmbH. Device for pivoting a printing unit. 4,401,025, Cl. 101-93.050.

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Yanagisawa, Kiyoshi: *See*—
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Yancy, Jerry W.: *See*—
Streckmann, George L.; and Yancy, Jerry W., 4,401,360, Cl. 350-96.150.

Yano, Hiroshi: *See*—
Noso, Kazunori; Yano, Hiroshi; Kishi, Norimasa; and Takeuchi, Yasuhisa, 4,401,852, Cl. 179-1.0VC.

Yano, Kenji: *See*—
Watabe, Tomiji; Kondo, Hideo; Okuda, Kyokai; Yano, Kenji; and Asano, Seiichi, 4,400,940, Cl. 60-502.000.

Yasuda, Kazuo: *See*—
Tokinage, Daizo; Kobayashi, Teruaki; Yuasa, Mitsuyoshi; Itoh, Michio; and Yasuda, Kazuo, 4,401,387, Cl. 356-341.000.

Yasuda, Sadami: *See*—
Hamada, Mitsuo; and Yasuda, Sadami, 4,401,500, Cl. 156-307.500.

Yasuda, Tadahiro: *See*—
Suzuki, Yoshiro; Yasuda, Tadahiro; Nishikawa, Masaji; Sato, Eiichi; and Aoki, Tadashi, 4,401,383, Cl. 355-3.0TR.

Yasui, Shinichiro: *See*—
Tagami, Katsutoshi; Sugimura, Masao; Yasui, Shinichiro; Takahashi, Tsuneo; Komuro, Katsusuke; and Suzuki, Nobuhiko, 4,402,050, Cl. 364-460.000.

Yasumoto, Seiichi: *See*—
Mizokawa, Sadao; Ito, Yoshiji; Hosoda, Yasuo; Kaita, Hiroshi; Okada, Tadaaki; Ohnishi, Hiroaki; Yasumoto, Seiichi; Fushimi, Hitoshi; Ide, Jushi; and Kuwahara, Hiroshi, 4,401,365, Cl. 350-96.200.

Yeda Research & Development Co., Ltd.: *See*—
Lwoff, Andre; Yerushalmi, Aharon; Cohen, Irun R.; and Moshe, Gideon B., 4,401,114, Cl. 128-200.140.

Yeh, Keming W.; and Bol, Izya, to Xerox Corporation. Application of grown oxide bumper insulators to a high-speed VLSI SASMESFET. 4,400,866, Cl. 29-571.000.

Yerkes, John W., to Atlantic Richfield Company. Charge control apparatus and method. 4,401,935, Cl. 320-9.000.

Yerushalmi, Aharon: *See*—
Lwoff, Andre; Yerushalmi, Aharon; Cohen, Irun R.; and Moshe, Gideon B., 4,401,114, Cl. 128-200.140.

Yokogawa, Seiji: *See*—
Yamada, Kenichi; Yokogawa, Seiji; Fujita, Shigehiko; Takenaka, Kiyoshi; and Tanoue, Koichi, 4,401,328, Cl. 289-2.000.

Yokosawa, Katsuto: *See*—
Uchikune; Tagami, Mutsukazu; Shimizu, Taketo; Yanagisawa, Kiyoshi; Yokosawa, Katsuto; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,401,960, Cl. 335-285.000.

Yokota, Shoichiro: *See*—
Horiuchi, Tomofusa; and Yokota, Shoichiro, 4,401,074, Cl. 123-339.000.

Yokota, Tadashi; and Watanabe, Wataru, to Clarion Co., Ltd. Lock-releasing mechanism for magnetic record/playback apparatus. 4,402,020, Cl. 360-72.100.

Yokota, Tadashi; and Watanabe, Wataru, to Clarion Co., Ltd. Magnetic record/playback apparatus. 4,402,026, Cl. 360-105.000.

Yorinks, Leonard H.; and Milton, Curtis E., Jr., to RCA Corporation. Broadband, high power, coaxial transmission line coupling structure. 4,401,955, Cl. 333-127.000.

Yoshida Kogyo K. K.: *See*—
Takahashi, Kihei; and Takeshima, Kiyoshi, 4,401,138, Cl. 139-384.00B.

Yoshida, Ryo: *See*—
Satomi, Takeo; Sumida, Seizo; and Yoshida, Ryo, 4,401,459, Cl. 71-94.000.

Yoshida, Takao: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,401,583, Cl. 252-174.110.

Yoshida, Tsutomu, to Sumitomo Light Metal Industries, Ltd. Apparatus for treating molten metal. 4,401,295, Cl. 266-207.000.

Yoshifuji, Junnosuke, to Nippon Cable System Inc. Lubricative, oily, cross-linked resin composition. 4,401,781, Cl. 524-261.000.

Yoshihara, Hideo: *See*—
Matsuo, Seitaro; Yoshihara, Hideo; and Yamazaki, Shinichi, 4,401,054, Cl. 118-723.000.

Yoshii, Nobuo: *See*—
Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, 4,401,278, Cl. 241-46.170.

Yoshikumi, Chikao; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; Oguchi, Yoshiharu; and Niimura, Koichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition having antitumor activity. 4,401,592, Cl. 260-112.00B.

Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, to Daidotokushuko Kabushikikaisha; and Sumitomo Kei Kinzoku Kogyo Kabushiki Kaisha. Method for heat treatment of metal strips. 4,401,484, Cl. 148-131.000.

Yoshimura, Kunimasa: *See*—
Iwamoto, Kenzi; Kuroyanagi, Makoto; Kawai, Hisasi; Yoshimura, Kunimasa; Nohira, Hidetaka; Ugajin, Mitsuyuki; and Ohki, Hisashi, 4,400,944, Cl. 60-605.000.

Yoshimura, Susumu; and Murakami, Mutsuaki, to Matsushita Electric Industrial Company, Limited. Conductive pyrolytic product and composition using same. 4,401,590, Cl. 252-514.000.

Yoshioka, Ryuzo: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,401,820, Cl. 548-344.000.

Young, Murray M., to University of Waterloo. Bioconversion of cereal grain straws to protein-enriched product. 4,401,680, Cl. 426-53.000.

Young, William C., to RCA Corporation. Filtered connector. 4,401,355, Cl. 339-147.00R.

Young, William C., to Burroughs Corporation. Oxidation of silicon wafers to eliminate white ribbon. 4,401,691, Cl. 427-93.000.

Yuasa, Mitsuyoshi: *See*—
Tokinage, Daizo; Kobayashi, Teruaki; Yuasa, Mitsuyoshi; Itoh, Michio; and Yasuda, Kazuo, 4,401,387, Cl. 356-341.000.

Yuasa, Yoshio; and Naruse, Kazuhiko, to Minolta Camera Kabushiki Kaisha. Light measuring device. 4,401,386, Cl. 356-226.000.

Yuhshin Co., Ltd.: *See*—
Nakamoto, Hiromasa; and Mentani, Akiyoshi, 4,400,954, Cl. 70-186.000.

Yurita, Chikara: *See*—
Kitamura, Yoichi; Ito, Makoto; and Yurita, Chikara, 4,401,874, Cl. 219-64.000.

Yuwa Sangyo Kabushiki Kaisha: *See*—
Iwaki, Takashi; and Tanaka, Takeji, 4,400,929, Cl. 53-580.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Breitweg, Werner; and Walter, Wolfgang, 4,400,991, Cl. 74-498.000.

Zamiska, Frank P.; and Tipton, Norman B., to Harshaw Chemical Company, The. Metal finishing barrel. 4,401,542, Cl. 204-213.000.

Zangs, Ludger: *See*—
Ploetz, Klaus V.; Zangs, Ludger; Schneider, Ralf; Bauer, Hannsgeorg; Otto, Josef; Walter, Manfred; Meyer, Helmut; and Heinrich, Erich, 4,401,296, Cl. 266-236.000.

Zannucci, Joseph S.: *See*—
Wooten, Willis C.; and Zannucci, Joseph S., 4,401,804, Cl. 528-272.000.

Zard Zard, Samir: *See*—
Barton, Derek H., Motherwell, William B.; and Zard Zard, Samir, 4,401,596, Cl. 260-239.550.

Zayatz, Robert A., to Wilson Greatbatch Ltd. Anode assembly for lithium-halogen cell. 4,401,736, Cl. 429-211.000.

Zegota, Michael, to Harding Carpets Limited. Non-stick latex foam fluorocarbon carpet backing. 4,401,704, Cl. 428-95.000.

Zeitz, Vernon: *See*—
Poetschke, Leonard E.; and Zeitz, Vernon, 4,401,437, Cl. 44-2.000.

Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Closed center programmed valve system with load sense. 4,401,009, Cl. 91-28.000.

Ziegler, Janos, to Licencia Talalmanyokat Ertekesito Vallalat. Apparatus for the baking of irregularly trimmed waffle, mainly cheese waffle. 4,401,015, Cl. 99-373.000.

Zills, Robert V., to Crymes Enterprises, Inc. Collapsible, insulative beverage container carrier. 4,401,245, Cl. 224-148.000.

Zimmerman, Thomas H., to Zimmermann, Sandra Mae, a part interest. Recreational toy wheel vehicle. 4,401,314, Cl. 280-206.000.

Zimmermann, Frank: *See*—
Heidemeyer, Paulus; Bigalke, Erhard; Zimmermann, Frank; and Werner, Hartmut, 4,401,200, Cl. 192-0.076.

Zimmermann, Sandra Mae: *See*—
Zimmerman, Thomas H., 4,401,314, Cl. 280-206.000.

Ziner, Edward H.; and Moroski, Adam A. Automobile door guard. 4,401,331, Cl. 293-128.000.

Zinken Italiana S.p.A.: *See*—
Linossi, Valentino, 4,401,142, Cl. 144-1.00R.

Zoebe, Hugo: *See*—
Prinz, Bruno; Rockel, Manfred B.; Rudolph, Gunther; Heubner, Ulrich; and Zoebe, Hugo, 4,401,488, Cl. 148-435.000.

Zoor, Reinhold, to Heinrich Wunder GmbH Co. KG. Fastening device for supporting brackets or luggage racks for automotive vehicles. 4,401,247, Cl. 224-315.000.

Zurner, Hans-Jurgen; Emmerling, Wolfram; and Steimer, Werner, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Injection and mixture formation process and apparatus to implement same. 4,401,071, Cl. 123-276.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Borg-Warner Corporation: *See*—
Smirl, Richard L., Re. 31,361, Cl. 74-863.000.

Cassella Aktiengesellschaft: *See*—
Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, Re. 31,366, Cl. 525-509.000.

D'Entremont, John R., to Texas Instruments Incorporated. Motor starting and protecting apparatus. Re. 31,367, Cl. 361-27.000.

Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, to Cassella Aktiengesellschaft. Melamine resin, process for its manufacture and its use for the manufacture of coated wood-based materials and laminates. Re. 31,366, Cl. 525-509.000.

Manno, Anthony C. Fiberglass airconditioner air pre-cooler. Re. 31,360, Cl. 62-305.000.

Mellors, Geoffrey W., to Union Carbide Corporation. Solid state electrolytes. Re. 31,365, Cl. 429-191.000.

Monsanto Company: *See*—
Wise, Kenneth W., Re. 31,364, Cl. 252-456.000.

Occidental Research Corporation: *See*—
Stover, Carole S., Re. 31,363, Cl. 208-254.00R.

Piesch, Steffen: *See*—
Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, Re. 31,366, Cl. 525-509.000.

Polaroid Corporation: *See*—
Shenk, Edwin K., Re. 31,362, Cl. 352-140.000.

Shenk, Edwin K., to Polaroid Corporation. Autofocus movie camera having pulsed terminal drive means. Re. 31,362, Cl. 352-140.000.

Smirl, Richard L., to Borg-Warner Corporation. Variable pulley transmission. Re. 31,361, Cl. 74-863.000.

Stover, Carole S., to Occidental Research Corporation. Method for reducing the nitrogen content of shale oil with a selective solvent comprising an organic acid and a mineral acid. Re. 31,363, Cl. 208-254.00R.

Texas Instruments Incorporated: *See*—
D'Entremont, John R., Re. 31,367, Cl. 361-27.000.

Union Carbide Corporation: *See*—
Mellors, Geoffrey W., Re. 31,365, Cl. 429-191.000.

Wise, Kenneth W., to Monsanto Company. Oxidation and ammoxidation catalysis. Re. 31,364, Cl. 252-456.000.

Wolf, Alfons: *See*—
Dorries, Peter; Piesch, Steffen; and Wolf, Alfons, Re. 31,366, Cl. 525-509.000.

LIST OF REEXAM PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Kah, Carl L. C., Jr., to Toro Co., The. Irrigation sprinkler system control employing pilot operated, pressure actuated and sequenced valve assemblies. B1 3,747,620, 8-30-83, Cl. 137-119.000.

Toro Co., The: *See*—
Kah, Carl L. C., Jr., B1 3,747,620, Cl. 137-119.000.

LIST OF DESIGN PATENTEES

Akigawa Electronic Corporation: *See*—
Tanabe, Masahiro, 270,337, Cl. D10-78.000.

Akzona Incorporated: *See*—
Johnston, James J., 270,325, Cl. D8-14.000.

Amway Corporation: *See*—
Powers, Robert M., 270,323, Cl. D7-21.000.

Arend, Rene, to Restaurant Technology, Inc. Formed meat product. 270,299, 8-30-83, Cl. D1-26.000.

Armstrong, John R., to F C F Limited. Hair dryer. 270,380, 8-30-83, Cl. D28-13.000.

Aronowitz, Robert J.; and Katzanek, Bernard D., to Robert Bernard Associates, Inc. Table. 270,308, 8-30-83, Cl. D6-27.000.

Ayukawa, Isao; Yamamoto, Sachio; and Tsukada, Akira, to Sharp Corporation. Vacuum cleaner. 270,390, 8-30-83, Cl. D32-21.000.

Baker, Olin H.; and Reilly, Robert P., to Meese, Inc. Quill can. 270,392, 8-30-83, Cl. D34-43.000.

Barnes Industries, Inc.: *See*—
Barnes, Terrance R., 270,366, Cl. D22-23.000.

Barnes, Terrance R., to Barnes Industries, Inc. Signal device for fishing rods. 270,366, 8-30-83, Cl. D22-23.000.

Bausch & Lomb Incorporated: *See*—
Boldt, Melvin H.; Chuboff, David P.; and Takeuchi, Tom, 270,354, Cl. D16-102.000.

Becker, Werner; and Reinke, Wolfgang, to Esselte Pendaflex Corporation. Protective pocket for the dialing knobs of the printhead of a labelling apparatus. 270,355, 8-30-83, Cl. D18-19.000.

Beltrami, Carla. Support for a sheet pad or the like. 270,356, 8-30-83, Cl. D19-86.000.

Benson, Frederick R. Jar. 270,331, 8-30-83, Cl. D9-370.000.

Bensussen, Gale K.: *See*—
Short, Carl J.; and Bensussen, Gale K., 270,379, Cl. D28-3.000.

Bergquist, Gregory D.; and Jones, John A., to Meadowcraft Inc. Serving cart. 270,391, 8-30-83, Cl. D34-21.000.

Blevins, Leslie, Jr. Firebox. 270,370, 8-30-83, Cl. D23-94.000.

Boldt, Melvin H.; Chuboff, David P.; and Takeuchi, Tom, to Bausch & Lomb Incorporated. Pair of sunglasses. 270,354, 8-30-83, Cl. D16-102.000.

Boleis, Gerard F. Display plate for an electronic navigation aid. 270,339, 8-30-83, Cl. D10-125.000.

Bolen, Ralph A., to Sawyer, John. Dual liquid storage container. 270,330, 8-30-83, Cl. D9-337.000.

Bowman, George E.: *See*—
Montgomery, Gregg C.; Bowman, George E.; and Skyer, Robert A., 270,351, Cl. D15-31.000.

Braun Aktiengesellschaft: *See*—
Ullmann, Roland, 270,385, Cl. D28-49.000.

Brown Group Recreational Products, Inc.: *See*—
Cunard, Joel C.; and Ziegler, William H., Jr., 270,344, Cl. D12-211.000.

Brown, Larry E.: *See*—
Lee, Wilton W.; and Brown, Larry E., 270,371, Cl. D24-22.000.

Burck, Joseph M., to Marvin Glass & Associates. Electronic game housing. 270,359, 8-30-83, Cl. D21-13.000.

Butsch, Otto R.: *See*—
Irwin, Samuel N.; Butsch, Otto R.; Lum, Francis; and Velazquez, Juan F., 270,348, Cl. D14-109.000.

C. R. Bard, Inc.: *See*—
Russo, Ronald D.; Darsie, Sam W.; and Curado, Len, 270,372, Cl. D24-28.000.

Canon Kabushiki Kaisha: *See*—
Yomo, Takashi; and Miyakawa, Akira, 270,347, Cl. D14-103.000.

Caretta, Renato, to Industrie Pirelli. Tire. 270,343, 8-30-83, Cl. D12-143.000.

Caterpillar Tractor Co.: *See—*
Clancy, Lawrence F.; Parks, John M.; and Poplawski, Eugene M., 270,350, Cl. D15-23.000.

Cavalie, Jean-Francois, to Technal International S.A. Extruded section for front face of facade of buildings. 270,375, 8-30-83, Cl. D25-74.000.

Champion Spark Plug Company: *See—*
Grime, Thomas E., 270,367, Cl. D23-18.000.
Grime, Thomas E., 270,368, Cl. D23-18.000.

Chance Games, Inc.: *See—*
de Gregorio, Louis W.; Rozzi, James; Polinsky, Jerrold L.; and Segal, Richard L., 270,361, Cl. D21-26.000.
de Gregorio, Louis W.; Rozzi, James; and Polinsky, Gary L., 270,362, Cl. D21-40.000.

Chas. "Robby" Robinson Enterprises, Inc.: *See—*
Starzec, Edward M., 270,302, Cl. D3-36.000.

Chuboff, David P.: *See—*
Boldt, Melvin H.; Chuboff, David P.; and Takeuchi, Tom, 270,354, Cl. D16-102.000.

Clancy, Lawrence F.; Parks, John M.; and Poplawski, Eugene M., to Caterpillar Tractor Co. Agricultural vehicle. 270,350, 8-30-83, Cl. D15-23.000.

Colgate-Palmolive Company: *See—*
Douglas, Livingston C., 270,333, Cl. D9-383.000.
Douglas, Livingston C., 270,334, Cl. D9-383.000.

Cunard, Joel C.; and Ziegler, William H., Jr., to Brown Group Recreational Products, Inc. Plastic wheel. 270,344, 8-30-83, Cl. D12-211.000.

Curado, Len: *See—*
Russo, Ronald D.; Darsie, Sam W.; and Curado, Len, 270,372, Cl. D24-28.000.

Daenen, Robert H. C. M.; and Jan de Coster, Pieter K., to Dart Industries Inc. Cheese dish or the like. 270,322, 8-30-83, Cl. D7-84.000.

Dafoe, Marguerite L.; and Walasek, Stanley W., to Johnson & Johnson Products, Inc. Holder for surgical instruments. 270,301, 8-30-83, Cl. D3-30.100.

Darsie, Sam W.: *See—*
Russo, Ronald D.; Darsie, Sam W.; and Curado, Len, 270,372, Cl. D24-28.000.

Dart Industries Inc.: *See—*
Daenen, Robert H. C. M.; and Jan de Coster, Pieter K., 270,322, Cl. D7-84.000.

Data General Corporation: *See—*
Stead, Dennis C., 270,349, Cl. D14-106.000.

Davis, Edwin W.; and Weinerman, Lee S., to Eastern Company, The. Latch housing with push button. 270,328, 8-30-83, Cl. D8-302.000.

de Gregorio, Louis W.; Rozzi, James; Polinsky, Jerrold L.; and Segal, Richard L., to Chance Games, Inc. Game board. 270,361, 8-30-83, Cl. D21-26.000.

de Gregorio, Louis W.; Rozzi, James; and Polinsky, Gary L., to Chance Games, Inc. Game wheel. 270,362, 8-30-83, Cl. D21-40.000.

Dillon, Richard R.; and Henneberg, Helmut H., to Honeywell Information Systems Inc. Document holder for a display terminal. 270,357, 8-30-83, Cl. D19-91.000.

Douglas, Livingston C., to Colgate-Palmolive Company. Combined bottle and cap. 270,333, 8-30-83, Cl. D9-383.000.

Douglas, Livingston C., to Colgate-Palmolive Company. Combined bottle and cap. 270,334, 8-30-83, Cl. D9-383.000.

Dynabrade, Inc.: *See—*
Fleckenstein, Elwin H., 270,369, Cl. D23-40.000.

Eastern Company, The: *See—*
Davis, Edwin W.; and Weinerman, Lee S., 270,328, Cl. D8-302.000.

Enger Kress Company: *See—*
Zautner, James I., 270,303, Cl. D3-56.000.

Errigo, Ernest E. Multi panel display case. 270,305, 8-30-83, Cl. D3-74.000.

Errigo, Ernest E. Two panel display. 270,358, 8-30-83, Cl. D20-10.000.

Esseltz Pendaflex Corporation: *See—*
Becker, Werner; and Reinke, Wolfgang, 270,355, Cl. D18-19.000.

F C F Limited: *See—*
Armstrong, John R., 270,380, Cl. D28-13.000.

Fleckenstein, Elwin H., to Dynabrade, Inc. Universal pneumatic swivel. 270,369, 8-30-83, Cl. D23-40.000.

Fleming, Ward. Entertainment table or similar article. 270,317, 8-30-83, Cl. D6-177.000.

French, Michael J. Plate with glass holder. 270,324, 8-30-83, Cl. D7-70.000.

Gaunt, Thomas N., to Plastona (John Waddington) Limited. Can or the like. 270,332, 8-30-83, Cl. D9-370.000.

GCC Beverages, Inc.: *See—*
Russell, Lamar H., 270,393, Cl. D34-45.000.

Gillette Company, The: *See—*
Gray, Michael J., 270,383, Cl. D28-47.000.
Gray, Michael J., 270,384, Cl. D28-48.000.
Poisson, Norman D., 270,382, Cl. D28-46.000.

Giroflex-Entwicklungs AG: *See—*
Ochsner, Koni, 270,309, Cl. D6-31.000.
Ochsner, Koni, 270,310, Cl. D6-31.000.
Ochsner, Koni, 270,311, Cl. D6-31.000.
Ochsner, Koni, 270,316, Cl. D6-67.000.

Gray, Michael J., to Gillette Company, The. Shaving cartridge. 270,383, 8-30-83, Cl. D28-47.000.

Gray, Michael J., to Gillette Company, The. Razor handle. 270,384, 8-30-83, Cl. D28-48.000.

Greenberg, Samuel. Plural display with a composite picture. 270,319, 8-30-83, Cl. D6-234.000.

Grime, Thomas E., to Champion Spark Plug Company. Spray gun. 270,367, 8-30-83, Cl. D23-18.000.

Grime, Thomas E., to Champion Spark Plug Company. Spray gun. 270,368, 8-30-83, Cl. D23-18.000.

Hardy, Bruce N., to Silver Street, Inc. Clip for microphone cable. 270,329, 8-30-83, Cl. D8-395.000.

Hawk, James J. Anchor post with integral fastener for flexible line. 270,365, 8-30-83, Cl. D21-255.000.

Heck, Richard A.; and Mastro, Louis L., to Square D Company. Panel meter. 270,338, 8-30-83, Cl. D10-102.000.

Helland, Sandy. Seat. 270,314, 8-30-83, Cl. D6-60.000.

Henneberg, Helmut H.: *See—*
Dillon, Richard R.; and Henneberg, Helmut H., 270,357, Cl. D19-91.000.

Hickey, Larry G., to Tropitone Furniture Co., Inc. Dining chair. 270,312, 8-30-83, Cl. D6-56.000.

Hollingshead, William P. Dental prophylactic device. 270,307, 8-30-83, Cl. D4-24.000.

Honeywell Information Systems Inc.: *See—*
Dillon, Richard R.; and Henneberg, Helmut H., 270,357, Cl. D19-91.000.

Industrie Pirelli: *See—*
Caretta, Renato, 270,343, Cl. D12-143.000.

Injoy-A-Stick: *See—*
Scherer, Richard A., 270,345, Cl. D13-12.000.

International Harvester Co.: *See—*
Montgomery, Gregg C.; Bowman, George E.; and Skyer, Robert A., 270,351, Cl. D15-31.000.

Irwin International, Inc.: *See—*
Irwin, Samuel N.; Butsch, Otto R.; Lum, Francis; and Velazquez, Juan F., 270,348, Cl. D14-109.000.

Irwin, Samuel N.; Butsch, Otto R.; Lum, Francis; and Velazquez, Juan F., to Irwin International, Inc. Integrated disc and tape recorder drive unit. 270,348, 8-30-83, Cl. D14-109.000.

Jan de Coster, Pieter K.: *See—*
Daenen, Robert H. C. M.; and Jan de Coster, Pieter K., 270,322, Cl. D7-84.000.

Jarvis Properties: *See—*
Jarvis, Robert L., 270,300, Cl. D2-261.000.

Jarvis, Robert L., to Jarvis Properties. Ornamental hat band. 270,300, 8-30-83, Cl. D2-261.000.

Johnson & Johnson Products, Inc.: *See—*
Dafoe, Marguerite L.; and Walasek, Stanley W., 270,301, Cl. D3-30.100.

Johnston, James J., to Akzona Incorporated. Electrical connector application tool. 270,325, 8-30-83, Cl. D8-14.000.

Jones, John A.: *See—*
Bergquist, Gregory D.; and Jones, John A., 270,391, Cl. D34-21.000.

Katzanek, Bernard D.: *See—*
Aronowitz, Robert J.; and Katzanek, Bernard D., 270,308, Cl. D6-27.000.

Kindberg, Jon L.: *See—*
Pennington, Davis W.; and Kindberg, Jon L., 270,374, Cl. D25-5.000.

Kyle, Gordon L. Convertible chair. 270,315, 8-30-83, Cl. D6-64.000.

Lam, Philip Y. Combined digital clock and thermometer. 270,335, 8-30-83, Cl. D10-4.000.

Lamplight Farms, Inc.: *See—*
Tendick, Donald W., Sr., 270,376, Cl. D26-63.000.

Lee, Jackey K., to Lomak Industrial Company Limited. Powder compact. 270,386, 8-30-83, Cl. D28-80.000.

Lee, Jackey K., to Lomak Industrial Company Limited. Vanity mirror. 270,388, 8-30-83, Cl. D28-83.000.

Lee, Jackey K., to Lomak Industrial Company Limited. Vanity mirror. 270,389, 8-30-83, Cl. D28-83.000.

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ISSUED AUGUST 30, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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1 VC	4,401,852
1.5 R	4,401,854
15.55 R	4,401,855
27 FH	4,401,856
110 A	4,401,857
111 R	4,401,858
121 D	4,401,859
175.2 C	4,401,860
175.3 R	4,401,861

CLASS 180

8 A	4,401,178
89.14	4,401,179
148	4,401,180
168	4,401,181
242	4,401,182

CLASS 182

8	4,401,183
45	4,401,184
93	4,401,185
113	4,401,186
121	4,401,187

CLASS 184

15 B	4,401,188

CLASS 186

68	4,401,189

CLASS 187

9 E	4,401,191
29 R	4,401,190
	4,401,192

CLASS 188

69	4,401,193
73.44	4,401,194
79.5 P	4,401,195
282	4,401,196
334	4,401,197
379	4,401,198

CLASS 191

23 A	4,401,511

CLASS 192

0.052	4,401,199
0.076	4,401,200
106.2	4,401,201

CLASS 194

55	4,401,202

CLASS 196

132	4,401,512

CLASS 198

392	4,401,203
431	4,401,204
524	4,401,205
549	4,401,206
580	4,401,207
781	4,401,208

CLASS 200

11 K	4,401,862
16 A	4,401,863
17 R	4,401,864
61.13	4,401,865
61.88	4,401,866
76	4,401,867
144 B	4,401,868
	4,401,869
147 R	4,401,870
150 A	4,401,871
153 G	4,401,872

CLASS 202

97	4,401,513

CLASS 203

15	4,401,514
25	4,401,515
33	4,401,516
53	4,401,517

CLASS 204

1 T	4,401,518
11	4,401,519
	4,401,520
12	4,401,521
15	4,401,522
	4,401,523
37 R	4,401,524
42	4,401,525
43 Z	4,401,526
47	4,401,527
78	4,401,528
95	4,401,529
98	4,401,530
114	4,401,531
129.1	4,401,532
130	4,401,533
158 R	4,401,535
159.11	4,401,537
159.2	4,401,536
180 P	4,401,538
192 R	4,401,539
196	4,401,540
206	4,401,541
213	4,401,542
244	4,401,543
288	4,401,544
291	4,401,545
298	4,401,546
415	4,401,547
435	4,401,548

CLASS 206

1.5	4,401,210
5	4,401,209
150	4,401,211
158	4,401,212
205	4,401,213
219	4,401,214
362.3	4,401,215
387	4,401,216
	4,401,220
408	4,401,217
446	4,401,218
566	4,401,219

CLASS 208

8 LE	4,401,549
	4,401,550
11 LE	4,401,551
	4,401,552
11 R	4,401,553
64	4,401,554
111	4,401,555
	4,401,556
139	4,401,557
	4,401,558
212	4,401,561
254 R	Re.31,363
262	4,401,559
324	4,401,560

CLASS 209

615	4,401,562

CLASS 210

130	4,401,563
150	4,401,564
258	4,401,565
351	4,401,566
500.2	4,401,567
515	4,401,568
610	4,401,569
639	4,401,570
680	4,401,571
681	4,401,572
724	4,401,573
728	4,401,574
746	4,401,575
803	4,401,576

CLASS 211

49 D	4,401,221
94	4,401,222
124	4,401,223

CLASS 215

11 B	4,401,224
211	4,401,225
250	4,401,226
252	4,401,227

CLASS 219

10.55 A	4,401,873
64	4,401,874
69 V	4,401,875
121 LJ	4,401,876
	4,401,877
137.31	4,401,878
206	4,401,879
213	4,401,880
216	4,401,881
335	4,401,882
381	4,401,883
492	4,401,884
523	4,401,885

CLASS 220

235	4,401,228
259	4,401,229
339	4,401,230
359	4,401,231
450	4,401,232

CLASS 221

36	4,401,233
92	4,401,234
107	4,401,235
211	4,401,236

CLASS 222

56	4,401,237
80	4,401,238
183	4,401,239
323	4,401,240
527	4,401,241
533	4,401,242
591	4,401,243

CLASS 223

37	4,401,244

CLASS 224

148	4,401,245
150	4,401,246
315	4,401,247

CLASS 225

47	4,401,248
97	4,401,249

CLASS 226

33	4,401,250

CLASS 227

130	4,401,251

CLASS 228

110	4,401,252
125	4,401,253
217	4,401,254

CLASS 229

37 R	4,401,255
53	4,401,256
72	4,401,257
92.8	4,401,258

CLASS 232

4 R	4,401,259

CLASS 236

9 A	4,401,260
10	4,401,261
46 R	4,401,262
84	4,401,263

CLASS 239

1	4,401,265
7	4,401,266
126	4,401,264
132.3	4,401,267
142	4,401,268
265.17	4,401,269
327	4,401,270
337	4,401,271
	4,401,272
498	4,401,273
690	4,401,274
704	4,401,275

CLASS 241

29	4,401,276
38	4,401,277
46.17	4,401,278
236	4,401,279
247	4,401,280

CLASS 242

107.2	4,401,281
107.4 A	4,401,282
118.32	4,401,283

CLASS 244

21	4,401,284
100 R	4,401,285
137 R	4,401,286

CLASS 248

425	4,401,287
476	4,401,288
483	4,401,289
565	4,401,290

CLASS 249

196	4,401,291

CLASS 250

203 R	4,401,886
216	4,401,887
231 R	4,401,888
328	4,401,889
363 S	4,401,890
374	4,401,891
566	4,401,892
572	4,401,893

CLASS 251

172	4,401,292
324	4,401,293

CLASS 252

8.8	4,401,577
	4,401,578
17	4,401,579
25	4,401,580
51.5 A	4,401,581
90	4,401,582
174.11	4,401,583
188.3 CL	4,401,585
194	4,401,584
378 R	4,401,586
389 A	4,401,587
421	4,401,588
429 B	4,401,589
456	Re.31,364
514	4,401,590
629	4,401,591

CLASS 260

112 B	4,401,592
112.5 R	4,401,594
112.5 T	4,401,593
239 A	4,401,595
239.55	4,401,596
244.4	4,401,597
349	4,401,598
397.45	4,401,599
464	4,401,601
465 E	4,401,600
	4,401,602
543.2	4,401,603
968	4,401,604
990	4,401,605

CLASS 261

93	4,401,606
121 R	4,401,607

CLASS 264

0.5	4,401,608
11	4,401,609
40.4	4,401,610
46.4	4,401,611
53	4,401,612
108	4,401,613
109	4,401,614
119	4,401,615
138	4,401,534
	4,401,616
332	4,401,617

CLASS 266

112	4,401,294
207	4,401,295
236	4,401,296
252	4,401,297

CLASS 267

140.1	4,401,298

CLASS 270

54	4,401,299
55	4,401,300

CLASS 271

96	4,401,301
251	4,401,302

CLASS 272

76	4,401,303

CLASS 273

85 G	4,401,304
86 F	4,401,305

CLASS 277

34.3	4,401,306
50	4,401,307

CLASS 279

114	4,401,308

CLASS 280

5 A	4,401,309
6.1	4,401,310
11.1 BR	4,401,311
47.17	4,401,312
47.31	4,401,313
206	4,401,314
259	4,401,315
277	4,401,316
625	4,401,317
630	4,401,318
655	4,401,319
801	4,401,320
804	4,401,321
808	4,401,322

CLASS 281

45	4,401,323

CLASS 285

90	4,401,324
231	4,401,325
318	4,401,326

CLASS 289

1.2	4,401,327
2	4,401,328
18.1	4,401,329

CLASS 292

144	4,401,346
300	4,401,330

CLASS 293

128	4,401,331
135	4,401,332

CLASS 294

81 SF	4,401,337
83 R	4,401,333
	4,401,334
84	4,401,335
94	4,401,336

CLASS 296

1 S	4,401,338
	4,401,339
93	4,401,340
185	4,401,341

CLASS 297

216	4,401,342
284	4,401,343
367	4,401,344

CLASS 299

64	4,401,345

CLASS 303

6 C	4,401,347
116	4,401,348

CLASS 307

64	4,401,894
66	4,401,895
118	4,401,896
297	4,401,897
310	4,401,898
350	4,401,899
352	4,401,900
362	4,401,901
415	4,401,902
449	4,401,903
482	4,401,904
546	4,401,905

CLASS 308

189 R	4,401,349

CLASS 310

156	4,401,906
203	4,401,907
229	4,401,908
323	4,401,909
369	4,401,910
800	4,401,911

CLASS 312

107	4,401,350

CLASS 313

17	4,401,912
25	4,401,913
111	4,401,914
142	4,401,915
413	4,401,917
628	4,401,916

CLASS 315

5.34	4,401,918
107	4,401,919
150	4,401,920
364	4,401,921
368	4,401,922

CLASS 318

6	4,401,923
	4,401,924
114	4,401,925
376	4,401,926
379	4,401,927
466	4,401,928
	4,401,929
603	4,401,930
696	4,401,931
	4,401,932
778	4,401,933
798	4,401,934

CLASS 320

9	4,401,935
59	4,401,936

CLASS 322

28	4,401,937
29	4,401,938
59	4,401,939

CLASS 323

365	4,401,940

CLASS 324

54	4,401,941
60 C	4,401,942
157	4,401,943
207	4,401,944
	4,401,945
208	4,401,946
338	4,401,947
378	4,401,948
402	4,401,949

CLASS 330

255	4,401,950
268	4,401,951
277	4,401,952
289	4,401,953
297	4,401,954

CLASS 333

127	4,401,955
152	4,401,956
165	4,401,957

CLASS 335

170	4,401,958
272	4,401,959
285	4,401,960
	4,401,961

CLASS 336

205	4,401,962

CLASS 337

282	4,401,963
343	4,401,964
408	4,401,965

CLASS 338

32 R	4,401,966
34	4,401,967
176	4,401,968

CLASS 339

17 CF	4,401,352
17 LM	4,401,351
18 C	4,401,353
19	4,401,354
113 L	4,401,358
147 R	4,401,355
253 R	4,401,359
258 R	4,401,356
272 R	4,401,357

CLASS 340

41 R	4,401,969
47	4,401,970
52 F	4,401,971
80	4,401,972
345	4,401,973
347 AD	4,401,974
384 E	4,401,975
522	4,401,976
539	4,401,977
628	4,401,978
629	4,401,979
666	4,401,980

715 4,401,981
758 4,401,982
785 4,401,983
4,401,984
799 4,401,985
870.32 4,401,986

CLASS 343

5 CF 4,401,987
700 MS 4,401,988
905 4,401,989

CLASS 346

75 4,401,990
4,401,991
76 L 4,401,992
76 PH 4,401,993
83 4,401,994
110 R 4,401,995
137 4,401,997
139 R 4,401,996
140 R 4,401,998
154 4,401,999
155 4,402,000

CLASS 350

6.8 4,401,362
96.15 4,401,360
96.16 4,401,364
96.20 4,401,365
96.23 4,401,361
4,401,366
96.3 4,401,363
126 4,401,368
162.22 4,401,367
349 4,401,369
357 4,401,370

CLASS 351

160 H 4,401,372
160 R 4,401,371

CLASS 352

140 Re.31,362

CLASS 354

23 D 4,401,373
25 4,401,374
141 4,401,375
173 4,401,376
4,401,377
195 4,401,378
214 4,401,379
246 4,401,380
303 4,401,381

CLASS 355

3 SH 4,401,382
3 TR 4,401,383
11 4,401,384
15 4,401,385

CLASS 356

226 4,401,386
341 4,401,387

CLASS 357

38 4,402,001
42 4,402,002
43 4,402,003
79 4,402,004

CLASS 358

28 4,402,005
31 4,402,006
75 4,402,007
86 4,402,008
125 4,402,009
133 4,402,010
154 4,402,011
160 4,402,012
4,402,013
217 4,402,014
280 4,402,015
4,402,016
293 4,402,017
342 4,402,018

CLASS 360

71 4,402,019
72.1 4,402,020
72.2 4,402,021
77 4,402,022
4,402,023
96.5 4,402,024
98 4,402,025
105 4,402,026
123 4,402,027

CLASS 361

27 Re.31,367
36 4,402,028
90 4,402,029
93 4,402,030
124 4,402,031
145 4,402,032
187 4,402,033
208 4,402,034
213 4,402,035
257 4,402,036
423 4,402,037

CLASS 362

20 4,402,038

CLASS 363

21 4,402,039

CLASS 364

200 4,402,040
4,402,041
4,402,042
4,402,043
4,402,044
4,402,045
4,402,046
426 4,402,047
442 4,402,048
447 4,402,049
460 4,402,050
475 4,402,051
506 4,402,052
513 4,402,053
554 4,402,054
579 4,402,055
705 4,402,056
900 4,402,057
4,402,058
4,402,059

CLASS 365

36 4,402,060
127 4,402,061
153 4,402,062
154 4,402,063
185 4,402,064
189 4,402,065
4,402,066
219 4,402,067

CLASS 367

26 4,402,068
154 4,402,069

CLASS 368

282 4,401,388

CLASS 369

43 4,402,070
67 4,402,071
132 4,402,072

CLASS 370

9 4,402,073
14 4,402,074
15 4,402,075
30 4,402,076
63 4,402,077
66 4,402,078
84 4,402,079
100 4,402,080

CLASS 371

21 4,402,081
22 4,402,082

CLASS 373

79 4,402,083

CLASS 374

140 4,401,389

CLASS 375

4 4,402,084

CLASS 376

106 4,401,618
206 4,401,619
247 4,401,620

CLASS 378

15 4,402,085
112 4,402,086

CLASS 382

53 4,402,087
68 4,402,088

CLASS 400

120 4,401,391
124 4,401,392
208 4,401,393
4,401,394
240.3 4,401,390
697.1 4,401,395

CLASS 403

13 4,401,396

CLASS 405

133 4,401,397
201 4,401,398
299 4,401,399

CLASS 408

71 4,401,400

CLASS 409

244 4,401,401

CLASS 414

218 4,401,402
292 4,401,404
335 4,401,403
408 4,401,407
428 4,401,405
564 4,400,841
589 4,401,406
687 4,401,408

CLASS 415

211 4,401,409

CLASS 416

186 R 4,401,410
196 R 4,401,411

CLASS 417

12 4,401,412
26 4,401,413
269 4,401,414
270 4,401,415
283 4,401,416
300 4,401,417
312 4,401,418
415 4,401,419

CLASS 418

201 4,401,420

CLASS 420

403 4,401,621
449 4,401,622

CLASS 422

1 4,401,623
12 4,401,624
50 4,401,625
151 4,401,626
186 4,401,627

CLASS 423

15 4,401,628
24 4,401,629
34 4,401,630
54 4,401,631
87 4,401,632
118 4,401,633
4,401,634
206 T 4,401,635
327 4,401,636
329 4,401,637
340 4,401,638
365 4,401,639
367 4,401,640
498 4,401,641
573 G 4,401,642
594 4,401,643
617 4,401,644
640 4,401,645

CLASS 424

1 4,401,646
1.5 4,401,647
49 4,401,648
60 4,401,649
78 4,401,650
80 4,401,651
101 4,401,652
114 4,401,653
162 4,401,654
4,401,655
177 4,401,656
4,401,657
4,401,658
4,401,659
180 4,401,660
4,401,661
183 4,401,662
233 4,401,665
245 4,401,666
246 4,401,667
4,401,668
248.54 4,401,669
250 4,401,670
251 4,401,671
260 4,401,672
263 4,401,673
271 4,401,674
285 4,401,675
309 4,401,676
317 4,401,677
321 4,401,663
365 4,401,664

CLASS 425

38 4,401,422
71 4,401,421
210 4,401,423
388 4,401,424

CLASS 426

15 4,401,678
36 4,401,679
53 4,401,680
94 4,401,681
285 4,401,682
331 4,401,683
546 4,401,684
576 4,401,685

CLASS 427

13 4,401,686
38 4,401,687
43.1 4,401,688
45.1 4,401,689
87 4,401,690
93 4,401,691
160 4,401,693
162 4,401,694
180 4,401,695
236 4,401,696
250 4,401,697
387 4,401,698
445 4,401,699

CLASS 428

17 4,401,700
31 4,401,701
35 4,401,702
72 4,401,703
95 4,401,704
131 4,401,705
158 4,401,706
166 4,401,707
198 4,401,708
209 4,401,709
229 4,401,710
252 4,401,711
289 4,401,712
290 4,401,713
306.6 4,401,715
317.3 4,401,716
425.1 4,401,717
448 4,401,718
457 4,401,719
4,401,725
483 4,401,720
484 4,401,721
488 4,401,722
554 4,401,723
564 4,401,724
610 4,401,726
4,401,727
614 4,401,728
623 4,401,729

CLASS 429

53 4,401,730
104 4,401,731
105 4,401,732
174 4,401,733
181 4,401,734
191 Re.31,365
195 4,401,735
211 4,401,736
218 4,401,737
221 4,401,714

CLASS 430

5 4,401,738
16 4,401,739
102 4,401,740
110 4,401,741
137 4,401,742
157 4,401,743
179 4,401,744
197 4,401,745
215 4,401,746
258 4,401,747
4,401,748
271 4,401,749
323 4,401,750
375 4,401,751
385 4,401,752
502 4,401,753
599 4,401,754

CLASS 431

22 4,401,425

CLASS 435

34 4,401,755
68 4,401,756
71 4,401,757
84 4,401,758
91 4,401,759
101 4,401,760
172 4,401,761
243 4,401,762

CLASS 436

115 4,401,763
500 4,401,764
533 4,401,765

CLASS 455

186 4,402,089
601 4,402,090

CLASS 464

41 4,401,426

CLASS 493

199 4,401,427
415 4,401,428

CLASS 494

30 4,401,429

CLASS 501

15 4,401,766
19 4,401,767
98 4,401,768

CLASS 521

113 4,401,769
120 4,401,770
121 4,401,771
167 4,401,772

CLASS 523

116 4,401,773
402 4,401,774
403 4,401,775
443 4,401,776
451 4,401,777

CLASS 524

89 4,401,778
114 4,401,779
225 4,401,780
261 4,401,781
313 4,401,782
371 4,401,783
424 4,401,784
508 4,401,785
591 4,401,786
600 4,401,787
714 4,401,788
827 4,401,789

CLASS 525

61 4,401,836
62 4,401,790
132 4,401,791
175 4,401,792
285 4,401,793
327.8 4,401,795
328.2 4,401,794
340 4,401,796
383 4,401,797
509 Re.31,366

CLASS 526

84 4,401,798
142 4,401,799
175 4,401,800

CLASS 528

67 4,401,801
167 4,401,802
176 4,401,803
272 4,401,804
302 4,401,805
498 4,401,806

CLASS 536

6.4 4,401,812
20 4,401,807
27 4,401,808
42 4,401,809
56 4,401,810
59 4,401,811
98 4,401,813

CLASS 544

277 4,401,814
300 4,401,815
320 4,401,816

CLASS 546

165 4,401,818
252 4,401,819

CLASS 548

136 4,401,817
344 4,401,820
374 4,401,821
567 4,401,822

CLASS 549

356 4,401,823
385 4,401,824
396 4,401,825

CLASS 556

429 4,401,826

CLASS 560

1 4,401,827
21 4,401,828
180 4,401,829

CLASS 562

478 4,401,830

CLASS 564

221 4,401,831
347 4,401,832
412 4,401,833

CLASS 568

559 4,401,835
881 4,401,834

CLASS 585

253 4,401,837
860 4,401,838

CLASS 604

4 4,401,430
4,401,431
4,401,432
159 4,401,433
310 4,401,434

CLASSIFICATION OF DESIGNS

D1—	26	270,299		64	270,315		370	270,331	D14—	103	270,347		52	270,363	D28—	3	270,379
D2—	261	270,300		67	270,316			270,332		106	270,349		71	270,364		13	270,380
D3—	30.1	270,301		177	270,317		383	270,333		109	270,348		255	270,365			270,381
	36	270,302		196	270,318			270,334	D15—	23	270,350	D22—	23	270,366		46	270,382
	56	270,303		234	270,319	D10—	4	270,335		31	270,351	D23—	18	270,367		47	270,383
	71	270,304		264	270,320		40	270,336		129	270,352			270,368		48	270,384
	74	270,305	D7—	17	270,321		78	270,337		144	270,353		40	270,369		49	270,385
	77	270,306		21	270,323		102	270,338	D16—	102	270,354		94	270,370		80	270,386
D4—	24	270,307		70	270,324		125	270,339	D18—	19	270,355	D24—	22	270,371		83	270,387
D6—	27	270,308		84	270,322	D11—		270,340	D19—	86	270,356		28	270,372			270,388
	31	270,309	D8—	14	270,325		128	270,341		91	270,357		33	270,373			270,389
		270,310		16	270,326	D12—	49	270,342	D20—	10	270,358	D25—	5	270,374	D32—	21	270,390
		270,311			270,327		143	270,343	D21—	13	270,359		74	270,375	D34—		270,391
	56	270,312		302	270,328		211	270,344			270,360	D26—	63	270,376		43	270,392
		270,313		395	270,329	D13—	17	270,345		25	270,361		75	270,377		45	270,393
	60	270,314	D9—	337	270,330		99	270,346		40	270,362	D27—	02	270,378			

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